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Institute of Agricultural Economics Belgrade

113th Seminar of the EAAE

"THE ROLE OF KNOWLEDGE, INNOVATION AND HUMAN CAPITAL IN MULTIFUNCTIONAL AGRICULTURE AND TERRITORIAL RURAL DEVELOPMENT"

Thematic Proceedings

Edited by
Danilo Tomić
Zorica Vasiljević
Drago Cvijanović

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113th EAAE Seminar

"THE ROLE OF KNOWLEDGE, INNOVATION AND HUMAN CAPITAL IN MULTIFUNCTIONAL AGRICULTURE AND TERRITORIAL RURAL DEVELOPMENT"

9th – 11th December 2009, Belgrade, Serbia
Venue: National Assembly of the Republic of Serbia, Kralja Milana Street 14

Detail Programme

Wednesday, 9th December

8.00 – 10.00: Registration of participants - National Assembly of the Republic of Serbia

10.00 – 11.30: Opening Session – Large Conference room

Chair persons:
Krijn Poppe, Secretary General EAAE, Hague, Netherlands
Drago Cvijanović, Director of IAE Belgrade, Serbia
Wim Heijman, President of Programme Committee, University of Wageningen, Netherlands
Danilo Tomić, Vice-President of Programme Committee, Higher Business School of Specialised Studies Novi Sad, Serbia
Zorica Vasiljević, Memeber of Programme Committee, Faculty of Agriculture Belgrade, Serbia

11.30 – 12.00: Coffee break – National Assembly restaurant

12.00 – 13.30: Plenary Session I – Large Conference room

Chairman**: Wim Heijman**, University of Wageningen, Netherlands
Danilo Tomić, Higher Business School of Specialised Studies Novi Sad, Serbia
Discussant: **Kenneth Thomson**, University of Aberdin, Scotland
Key speakers:
1) **Alan Randall**, Ohio State University, USA - "Multifunctional agriculture and regional economic growth"
2) **Gro Ladegard, Eirik Romstad,** Norwegian University of Life Sciences, Norway - "Understanding the demand side and coordinating the supply side for connected goods and services"

13.30 – 14.00: Coffee break – National Assembly restaurant

14.00 – 15.00: Plenary Session II – Large Conference room

Chairman**: Dan Marius Voicilas**, Romanian Academy, Bucharest, Romania
Discussant: **Zoran Njegovan,** Faculty of Agriculture Novi Sad, Serbia
Key speaker:
1) **Andras Nabradi**, University of Debrecen, Hungary - "Role of innovations and knowledge - infrastructure and institutions"

15.00 - 16.00: Lunch time - National Assembly restaurant

16.00 - 17.30: **Parallel Workshops Sessions (A, B, C, D)**

A. Territorial competitiveness: factors of development and the role of agriculture – Large Conference room

Chairman: Zorica Vasiljević, Faculty of Agriculture Belgrade, Serbia
Donatela Privitera, University of Catania, Faculty of Education, Italy

A-1	Eudokia Balamou, Daina Saktiņa, Willam H. Meyers	Targeting lagging territories with EU rural support policy: case study in Latvia
A-2	Dragica Božić, Petar Munćan, Natalija Bogdanov	Credits for Serbian agriculture in the transition period
A-3	Ohe Yasuo, Shinichi Kurihara, Shinpei Shimoura	Evaluating operators' satisfaction and potential of local resources for rural tourism: evidence from Matsuura in Japan
A-4	Victor Manole, George Cristian Popescu, Sorin Davitoiu	Medicinal and aromatic plants (map) – a chain of competitiveness in Romanian agriculture
A-5	Katarina Čobanovic, Emilija Nikolić Đorić, Beba Mutavdžić	Regional aspects of agricultural income level in Vojvodina province in function of basic production factors

B. Role of human and social capital in building up agro-regional identity, institutional reform and competitiveness – Small Conference room

Chairman: Vesna Popović, IAE Belgrade, Serbia
Valentina Cristiana Materia, University Ancona, Italy

B-1	Urszula Bronisz, Wim Heijman	The impact of social capital on the regional growth and competitiveness in Poland
B-2	Stanislav Zekić, Milivoj Gajić, Koviljko Lovre	Partial productivity of agriculture in the Western Balkan countries - implication for competitiveness of the rural economy
B-3	Ioan Done, Jean Vasile Andrei, Claudiu Cicea	Preserving and enhancing solidarity and thrust capital in the countryside. A short analysis in the general context of agriculture based economy
B-4	Dan Marius Voicilas, Gorica Cvijanović, Nada Mijajlović	The role of the European research networks in rural development
B-5	Maria Carmela Macrì, Maria Angela Perito	Social agriculture: a pattern between farm innovation, social responsibility and multifunctionality

C. Role of innovations and knowledge - infrastructure and institutions – Green room
Chairman: Anne Vuylsteke, Flemish Government, Brussels, Belgium
Predrag Vuković, IAE Belgrade, Serbia

C-1	Florence Bedoin, Troels Kristensen, Egon Noe	Bridging the gap between farmers and consumers: value creation and mediation in "pasture-raised beef" food networks
C-2	Miladin Ševarlić, Marija Nikolić, Richard Simmons	Standpoints of the directors of agricultural co-operatives about the membership and the work of cooperative unions in Serbia
C-3	Francesco Contò, Piermichele La Sala, Paolo Papapietro	The Metapontum agro-food district of quality": a case study of knowledge, innovation and improvement of human capital in territorial rural development
C-4	Catherine Laurent, Marielle Berriet Solliec, Marc Kirsch, Pierre Labarthe, Aurélie Trouvé	Knowledge production, multifunctionality of agriculture and public decisions: critical issues of contemporary controversies
C-5	Biserka Komnenić, Danilo Tomić, Gordana Tomić	Agrifood industry as industry intensively based on knowledge - case study of Vojvodina

D. Investment in human capital, extension and agricultural R&D – Blue room
Chairman: Romina Kabranova, Faculty of Agricultural Sciences and Food Skopje, Macedonia
Dejan Janković, Faculty of Agriculture Novi Sad, Serbia

D-1	Blasi E., Cicatiello C., Passeri N.	From the concept of multifunctional agriculture to the measure of multifunctional farming
D-2	Nebojša Novković, Šandor Šomođi, Milenko Matković	Selection of agricultural land for multifunctional agriculture - quantitative model
D-3	Ferhat Ćejvanović, Aleksandar Đurić, Tatjana Vujić	The competitiveness of tourism and rural tourism offer in Bosnia and Herzegovina through application of the marketing approach
D-4	Kristina Jansson, Ida Terluin	Alternative futures of rural areas in the EU - a comparative analysis of scenario studies
D-5	Dragić Živković, Sreten Jelić, Zoran Rajić	Agricultural extension service in the function of rural development

17.30 – 20.00: Free time
20.00 – 22.00: Cocktail/dinner - National Assembly restaurant

Thursday, 10th December

8.30 - 10.00: **Parallel Workshops Sessions (continued A, B, C, D)**

A. Territorial competitiveness: factors of development and the role of agriculture (continued) – Large Conference room
Chairman: Natalija Bogdanov, Faculty of Agriculture Belgrade, Serbia
Lívia Madureira, UTAD, Portugal

A-6	Marleen Schouten, Martijn van der Heide, Wim Heijman	Resilience of social-ecological systems in European rural areas: Theory and prospects
A-7	Ivan Đurić, Thomas Glauben, Linde Götz	The influences of export controls on wheat markets in Serbia during the food crisis 2007-2008
A-8	Slobodan Ceranić, Radojka Maletić, Svijetlana Janković Šoja	Small and medium size enterprises as support to development of agribusiness of Republic of Serbia
A-9	William H. Meyers, Emilija Kairytė, Erika Ribašauskienė	Lithuanian Diagnostics of Lagging Territories: Evaluation and Insights
A-10	Donatella Privitera	Factors of development of competitiveness: the case of organic – agritourism

B. Role of human and social capital in building up agro-regional identity, institutional reform and competitiveness (continued) – Small Conference room
Chairman: Biserka Komnenić, Higher Business School of Specialised Studies, Novi Sad, Serbia
Matteo Vittuari, Faculty of Agriculture Bologna, Italy

B-6	Jonel Subić, Zorica Vasiljević, Sanjin Ivanović	Education of agricultural producers intended to improve farm operations and management
B-7	Lies Messely, Joost Dessein, Ludwig Lauwers	Branding regional identity as driver for rural development
B-8	Agata Nicolosi, Domenico Cambareri, Marco Strazzulla	Human capital and family farm in the olive growing system of the Calabria Region
B-9	Idda Lorenzo, Roberto Furesi, Pietro Pulina	Human capital and farm households - a map of management models in Italy
B-10	Rade Popović, Marija Knežević, Miloš Tošin	State and perspectives in competitiveness of one farm type in Serbia

C. Role of innovations and knowledge - infrastructure and institutions (continued) – Green room
Chairman: Claudiu Cicea, ASE, Bucharest, Romania
Nebojša Novković, Faculty of Agriculture Novi Sad, Serbia

C-6	Žaklina Stojanović, Emilija Manić	Cross-border cooperation, protected geographic areas and extensive agricultural production in Serbia
C-7	Laszlo Karpati, Zsolt Csapo, Georgina Vanyi Arvane	Innovation and rural development – the solution for the Hungarian bee-keeping sector
C-8	Branko Mihailović, Vladana Hamović,Vesna Paraušić	Knowledge economy and *innovations as factors of agrarian* competitiveness
C-9	Imre Fertő, Csaba Forgács	The choice between conventional and organic farming – a Hungarian example
C-10	Ivana Ralević Ljubanović, Dejan Đurić, Dragana Đurić	Foreign direct investments in Serbia – state and perspectives

D. Investment in human capital, extension and agricultural R&D (continued) – Blue room
Chairman: Catherine Laurent, INRA, Paris, France
Bojana Bekić, IAE Belgrade, Serbia

D-6	Rino Ghelfi, Sergio Rivaroli	Migration and human capital in Italian agricultural labour market: a case study analysis
D-7	Julia Doitchinova, Ivan Kanchev, Albena Miteva	Multifunctional agriculture in Bulgaria – opportunities and prospects
D-8	Živojin Petrović, Dejan Janković, Jovana Čikić	Problems in the extension work and farmers' needs in Serbia
D-9	Barbara Pancino, Bonaiuti M., Franco Sotte	The "stock and flows" approach to the governance of self-sustainable rural systems
D-10	Milan Milanović, Milutin Đorović, Simo Stevanović	Human capital and sustainability of rural development

10.00 – 10.30: Coffee break – National Assembly restaurant

10.30 – 12.00: Poster Session - National Assembly Hall

Chairman: Mirela Matei, Faculty of Economy Ploesti, Romania Marek Wigier, National Research Institute, Warszawa, Poland

1	Slavica Arsić, Nataša Kljajić, Mirjana Savić	The importance of protection of autochthonous dairy products and possibilities to increase autochthonous dairy products production observed as factors in the development of the municipality of Štrpce
2	Vedrana Babić, Radovan Lala Davidov, Aleksandra Prodanović, Časlav Lačnjevac	Prospectives of Homolja as an eco-destination
3	Ion Bucur, Cristian Bucur	Romanian farmer – owner, businessman and economical goods consumer
4	Gabriel Croitoru, Mihai Mieila	The competitive position of the Romanian agriculture
5	Nada Milošević, Velibor Potrebić, Željko Arsenijević	Producers education about microbiological inoculates application in function of soil fertility
6	Crina Turtoi, Camelia Toma, Camelia Gavrilescu	Evolution of the production factors in the Romanian agriculture and its' potential for a competitive development in the enlarged EU
7	Jorde Jakimovski	The role of human capital in rural development
8	Stojan Jevtić, Branislav Gulan, Vojislav Stanković	Agricultural reforms in Serbia
9	Slađana Marinković, Nebojša Nedić	Competitiveness of apicultural products on small beekeeping farms
10	Božidar Milošević, Lamberto Lamberti, Milinko Milenković	Sustainable agriculture and future challenges for agricultural research and extension services
11	Marina Morekhanova	Transformation of rural population vital strategies
12	Gabriela Nedita, Mirela Stoian, Anca Elena Rădulescu	Designing the collaborative platform meant to increase organisational competitiveness in agro-food research
13	Constanta Popescu, Constantin Popescu, Silvia-Elena Popescu	Non - conflictual competetive objectives in the ecosystem management

14	Gabriel Popescu, Constantin Florentina, Teodora Menda	Efficient transfer of knowledge in agriculture through cooperative structures
15	Svetlana Roljević, Radojica Sarić, Boris Kuzman	Significance in innovation and knowledge appliance in system of organic agriculture in Serbia
16	Florin Sala, Alin Dobrei	Agricultural systems – role and importance in the environment protection and sustainable rural development in Banat, Romania
17	Vladimir Anatolievich Shibaykin	Agricultural economics diversification and alternative employment in rural regions of Russia
18	Svetlana Živanović Turudija, Tomislav Živanović, Tatjana Marković	Education of participants in map sector with an aim to improve market competitiveness and rural development in Serbia
19	Mihai Botezatu	Efficiency of capital investments in ecological agricultural production and possible sources of financing
20	Anca Dachin, Letitia Zahiu	Structural changes of the Romanian agriculture in the process of European integration
21	Mariana Bran, Iuliana Dobre, Radu Voicu	The development of agricultural activities in the hill area of Drobotfor valley from Bacau district, Romania
22	Simion Certan, Ion Certan	Considerations and diminuation of the economic - financial crisis in agriculture of Moldova

12.00 – 12.30: Coffee break – National Assembly restaurant

12.30 – 14.00: Donors Presentations – Large Conference Room

14.00 - 15.00: Lunch time - National Assembly restaurant

15.00 - 16.30: **Parallel Workshops Sessions (continued A, B, C, D)**

A. Territorial competitiveness: factors of development and the role of agriculture (continued) – Large Conference room
Chairman: Dan Marius Voicilas, Romanian Academy, Bucharest, Romania
Marija Nikolić, Faculty of Agriculture Belgrade, Serbia

A-11	Nicolae Istudor, Irina Elena Petrescu	The role of consultancy in the process of applying for European funds for rural development
A-12	Romina Kabranova, Zlatko Arsov	Territorial and natural priorities of Macedonia – important factor for tobacco production development
A-13	Mirela Matei, Adrian Stancu, Predrag Vuković	The interdependence between agriculture and climate change - a European perspective
A-14	Lana Ivanović, Marko Jeločnik, Bojana Bekić	Possibilities for increment of live stock breeding competitiveness on the territory of Belgrade city
A-15	Andrzej Kowalski, Marek Wigier, Paweł Chmieliński	Poland's adjustment to challenges of changing agricultural policy of the European Union

B. Role of human and social capital in building up agro-regional identity, institutional reform and competitiveness (continued) – Small Conference room
Chairman: Laszlo Karpati, University of Debrecen, Hungary
Ivan Đurić, IAE Belgrade, Serbia

B-11	Zoran Simonović, Dragoljub Simonović, Perica Gligić	Agrarian regions in Serbia as natural foundation and market chance in circumstances of transition
B-12	Vlade Zarić, Danijela Petković, Milorad Radošević	Consumer perception towards traditional Serbian agricultural and food products
B-13	Anne Vuylsteke, Dirk Van Gijseghem	Challenges for the Flemish agricultural research institutes to support an innovative and competitive agricultural sector
B-14	Saša Todorović, Mihajlo Munćan, Marina Miljković	The growing importance of activities diversification for enhancing family farms competitiveness
B-15	Andreea Ion Raluca, Magdalena Turek, Adrian Turek	Marketing research about perceptions of producers of Romanian traditional products

C. Role of innovations and knowledge - infrastructure and institutions (continued) – Green room
Chairman: Žaklina Stojanović, Faculty of Economy Belgrade, Serbia
Ferhat Ćejvanović, Government of Brcko District, BiH

C-11	Matteo Vittuari, Andrea Segre	The role of small farms in Republika Srpska: barriers and opportunities for modernization
C-12	Jovan Zubović, Ivana Domazet, Ivan Stošić	Development of human capital as tool for improving productivity of agricultural sector – case of Serbia
C-13	Diego Begalli, Stefano Codurri, Davide Gaeta	Bio-energy from winery by-products: a new multifunctional tool for the Italian wine districts
C-14	Denis Boissin	Boundary organizations: an efficient structure for managing knowledge in decision-making under uncertainty
C-15	Branislav Vlahović, Anton Puškarić, Branka Maksimović	Competitiveness of wine export from the Republic of Serbia

D. Investment in human capital, extension and agricultural R&D (continued) – Blue room
Chairman: Julia Doitchinova, University of National and World Economy, Sofia, Bulgaria
Vuk Radojević, Faculty of Agriculture Novi Sad, Serbia

D-11	Michael Vassalos, Carl R. Dillon, Pavlos Karanikolas	Farm decision-making in a multifunctional context: the case of conventional and organic farming in Kerkini district, Greece
D-12	Vesna Popović, Branko Katić, Jelena Živanović	Rural development network and territorial competitiveness
D-13	Valentina Cristiana Materia, Roberto Esposti	How do public institutions select competitive agricultural R&D projects? - the case of an Italian region
D-14	Blaženka Popović, Tamara Paunović, Zoran Maletić	Development of SMEs in agribusiness of Vojvodina communes - state and perspectives
D-15	Lívia Madureira, Costa Susete	Multifunctional agriculture as an innovation path for rural areas

16.30 – 17.00 – Coffee break – National Assembly restaurant

17.00 – 18.30: **Panel Discussion – Large Conference room**

Moderator**: Csaba Forgacs,** University of Budapest, Hungary
Discussion:

Danilo Tomić, Vice-President of Programme Committee, Higher Business School of Specialised Studies Novi Sad, Serbia
Andrzej Kowalski, National Research Institute, Warszawa, Poland
Gro Ladegard, Norwegian University of Life Sciences, Norway
Maria Carmela Macrì, National Institute of Agricultural Economics, Roma, Italy
Alan Randall, Ohio State University, USA

18.30 – 20.00: Free time

20.00 – 22.00: Cocktail/dinner – Deputy Club, Tolstojeva street 2

Friday, 11th December

8.30 - 10.30: Field trip to Institute Tamiš (bus departure infront of City Hall, across the National Assembly of Republic of Serbia)

10.30 – 11.30: **Glogonj – Special Session** – Agricultural science in Serbia

Chair persons:

Jovica Zagorac, president of Glogonj local community
Zorica Vasiljević, Faculty of Agriculture Belgrade, Serbia
Jonel Subić, IAE Belgrade, Serbia

Exposure title – System of education, scientific-research and consulting work in agriculture of Serbia

Speaker: **Drago Cvijanović**, Director of IAE Belgrade, Serbia

11.30 – 12.00: Coffee break

12.00 – 14.00: Farm visit

14.00 – 17.00: Lunch time with music

17.00 – Departure for Belgrade

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PREFACE

The Institute of Agricultural Economics – Belgrade in 2009 celebrates the 60-years anniversary of its existence and activity. On that occasion the EAAE Board has entrusted to the Institute, as an important and respectable scientific institution for development of agroeconomic science in this part of Europe, an organization of the 113th EAAE Seminar under the title ***„THE ROLE OF KNOWLEDGE, INNOVATION AND HUMAN CAPITAL IN MULTIFUNCTIONAL AGRICULTURE AND TERRITORIAL RURAL DEVELOPMENT"*.** The topic is very actual one considering that in 2010 European Union will change its direction toward economy based upon knowledge as the most competitive one in the world, in order to resist to competition of the oversea countries (India, China, Japan etc.).

The Seminar took place in Belgrade (Serbia) on 9th-11th December 2009. More than 90 papers have been submitted for the Seminar. An International Program Committee has made selection of the papers on the basis of anonymous reviews and classified them into six sessions.

In the first plenary session four introductory papers upon call of the Program Committee have been presented by eminent scientists from Europe and USA. Beside introductory papers, there have been also presented 60 papers in four thematic sessions (15 papers by each session). Those are the following sessions:

a) *Territorial competitiveness: factors of development and the role of agriculture*
b) *Role of human and social capital in building up agro-regional identity, institutional reform and competitiveness*
c) *Role of innovations and knowledge - infrastructure and institutions*
d) *Investment in human capital, extension and agricultural R&D.*

Due to a great number of submitted papers on one side, as well as the restricted number of published papers on the other side, the Program Committee has classified 22 papers into the *poster section*, which does not depreciate their quality in any case.

Finally, we express gratitude to the EAAE Board for the trust, to the authors, then to the reviewers who contributed by successful suggestions to the improvement of the papers and posters, as well as to the Program Committee members, and to the National Parliament of the Republic of Serbia and local community of Glogonj village that enables Seminar to take place in their premises.

Editors

PLENARY PAPERS SESSION

MULTIFUNCTIONAL AGRICULTURE AND REGIONAL ECONOMIC GROWTH[1]

Alan Randall[2]

1. Introduction

It might be conjectured that new models of regional economic development, combined with the emerging understanding of multifunctional agriculture, would suggest a new and perhaps more optimistic perspective on the potential of agriculture as an engine of regional economic growth. My purpose here is begin the process of surveying the relevant literature, unraveling the arguments and gleaning evidence from the published empirical record, and drawing-out some implications that may help focus our deliberations over the next few days.

Historically, it has been difficult to make the case for agriculture as an engine of economic development in rural regions. The broad sweep of the evidence has tended to point in the opposite direction – the rising value of labor in the industrial and post-industrial economy has tended to draw workers to urban centers, and in so doing depopulate rural regions. To the extent that the rural population has proven relatively immobile, spatial inequalities in income, wealth, and opportunity have persisted to the detriment of rural regions. The traditional rural development agenda has had perhaps three organizing objectives: to correct any market failures that would disadvantage rural regions disproportionately; to identify niches where rural communities can compete in the industrial and post-industrial economies, and to find ways of providing adequate services (especially, but not limited to, health, education, and communications) to support a desirable quality of life in rural regions.

Europe has its own particular perspective on regional and territorial economic disparities, arising from a legacy of unequal participation in the industrial revolution, the partition of Europe into adversarial blocs in the cold war years, and the commitment of the European Union to economic development in economically lagging regions and economic integration throughout the EU. More recently, successive waves of EU expansion have magnified the task of economic integration.

The question motivating this seminar, and this opening keynote address, is whether new models of regional economic development (e.g. the "new economic geography"), new insights that have captured a lot of popular attention in recent years (e.g. amenity-driven growth, the "earth is flat", and the "rise of the creative class"), and new perspectives on agriculture as a source of amenities (multifunctional agriculture, MFA) that might attract worker/consumers and hence growth are sufficient to fundamentally change our perspective on rural development and economic integration, and change it in a more optimistic direction. To what extent does the contemporary emphasis on MFA, as opposed to commodity production agriculture improve prospects for regional economic development and make agriculture more central to those prospects?

2. Building blocks

To set the scene for subsequent developments, I begin with a brief review of the economic role

1 Prepared for 113th Seminar, European Association of Agricultural Economics, Belgrade, Serbia, December 9 – 11, 2009.

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of commodity agriculture, and the concepts of economic geography based on the work of J. H. von Thunen.

Agriculture, understood as production of food and fiber commodities, allowed enormous expansion of carrying capacity for humans and generated huge rents – the cathedrals and palaces of Europe are a tribute to the ability of agriculture to generate massive surpluses in pre-industrial times. The modernization of agriculture in the eighteenth and nineteenth centuries released most of the agricultural labor force, paving the way in that respect for the industrial revolution. Labor simply matters very much less than it used to, in the production of food and fiber commodities. Land and natural resources also matter less, for two reasons: agricultural technologies have been land-saving as well as labor-saving; and the colonization of the "new world" vastly expanded the land base and the supply of food and fiber commodities. For more than a century now, new-world exporting nations have tolerated a depopulation of the countryside even greater than Europe's, and they tend to believe that the relatively large proportion of the labor force in agriculture in Europe today can be explained only by maintained impediments to food and fiber imports.

The pioneering economic geography of Thunen assumes a city serving an essential function (marketing, perhaps), and organizes economic activity around the city on the basis of a single but very fruitful insight – distance is costly, and it costs more for some activities than others. The city is located, one presumes, by some initial but unexplained advantage, and the surrounding countryside is homogenous except for the matter of distance from the city. The wilderness (land abandoned to economic activity because it is impossible to generate positive rents by working it) is not infertile badlands; rather, it is just too distant given prevailing prices and technology – an assumption that allows it to serve as a reserve to be brought into production should economic conditions warrant it. An additional purpose served by the wilderness is to isolate the city-state from economic competition from other city-states.

Thunen's economic geography leads logically, I think, to core-periphery models of the regional economy. Urban theorists applied Thunen's insights to the internal economic geography of the city which, in their models, was characterized by lower land prices and increasing lot size with increasing distance from the central business district. The city grows to absorb farmland by out-bidding farmers at the urban fringe, and distance from the city determines the use and value of agricultural land. Basic core-periphery models do not offer much hope for economic development in the periphery – it is the city that provides the economic engine for the region, while the hinterlands provide raw materials and undifferentiated labor that can be bid away by the core.

3. The "new economic geography

The new economic geography, NEG (Krugman 1991) was motivated by the desire to explain a much richer pattern of agglomeration that seems to persist in the real world. With roots in Krugman's earlier contributions to the international trade literature, it locates population concentrations on the basis of some initial advantage in production, and explains their relative growth mostly by agglomeration efficiencies and, in the case of sophisticated products, a deepening labor market. NEG's organizing objectives (Fujita and Krugman 2002) are to explain the economics of location in terms of the whole economy, which argues for general equilibrium formulations with explicit micro-foundations; and to identify centripetal and centrifugal forces (forces of attraction and repulsion) that explain agglomeration and its limits. Monopolistic competition and increasing returns play important roles in NEG, along with costs of transportation between regions.

In the simplest models, the manufacturing (i.e. urban) sector produces a continuum of varieties

of a horizontally differentiated product; each variety is produced by a separate firm with scale economies, using workers as the only input. The agriculture sector produces a homogeneous good under constant returns, using farmers as the only input. More complex models allow vertical and horizontal differentiation of products and heterogeneity of urban workers and a picture emerges of highly agglomerated cities as having deeper labor markets, i.e. greater horizontal and vertical differentiation among workers, including more highly skilled and specialized workers. NEG is open to the idea that concentrations of diversified skilled workers (human capital) may attract firms to a region, especially specialized firms.

Eventually, the idea of agglomeration (from NEG) was added to the core-periphery models (rooted in Thunen) of the city and surrounding hinterland – increasing complexity of the urban economy (as well as increasing size) was an advantage, because it generated cost advantages in production.

Frankly, incorporation of urban agglomeration into core-periphery models does little to improve the prospects for economic development in the more remote parts of the periphery. Agricultural rents may rise with growth of the city (especially for land near the urban fringe). Beyond the fringe, Thunen-based models permit increasing labor intensity as land rents rise, but the labor-saving nature of technological progress in agriculture tends to militate against it.
From the perspective of modern core-periphery models, can commodity agriculture serve as an engine of regional economic growth going forward? Perhaps it can, in a few favored places, but it seems very unlikely to do so across the board. After all, commodity agriculture is peripheral (literally and metaphorically) in a theory of regional growth that emphasizes agglomeration efficiencies and deepening labor markets. Not only that, but there is some empirical evidence for the "resources curse" hypothesis. Gylfason (2000) presents cross-sectional evidence that natural resource abundance and extensive agriculture appear to have impeded economic growth in the transition economies in Central and Eastern Europe and Central Asia since 1990. Possible explanations are that heavy dependence on natural resources and agriculture may result in rent seeking (e.g. corruption) and policy failures (e.g. inflation), and may induce a complacency that discourages genuine saving, thereby retarding economic growth.

4. Amenity-driven growth

The new economic geography paid no attention to household preferences and hence locational amenities. But national wage-rent hedonic models, beginning with Blomquist *et al.* (1988), have indicated consistently that high-amenity regions have an advantage in attracting workers and consumers. Specifically, they document that at the margin worker-consumers will accept wage discounts in order to move to (or remain in) high amenity regions, and demand wage premiums to work in low amenity regions.

Conceptual models show that, under certain conditions, high-amenity regions may attract residents and thereby experience growth (Irwin *et al.* 2008). Three factors help rural regions (rural amenities, urban disamenities, and urban congestion), and one hurts (urban efficiencies from agglomeration). To begin sorting-out the impacts of these various influences in a systematic way, Irwin *et al.* adapted a simple two-region dynamic model of regional factor mobility and urban agglomeration (Fujita and Thisse 2002) to examine the role of environmental amenities and urban congestion in core-periphery patterns of regional development. People are mobile between the two regions but they must live where they work, so their location decisions are influenced by the wages and amenity levels prevailing in each region.

In principle, the core-periphery pattern may emerge from some initial advantage in resources or amenities plus agglomeration effects, so an amenity-driven core-periphery pattern is possible. However, as is common in this kind of modeling, assume that an urban core has arisen due to some historical resource advantage and subsequent agglomeration effects. With growth in the urban core, urban disamenities (congestion, pollution, etc.) may eventually outweigh the production externalities and urban amenities that drove urban growth, dispersing population and economic activity to the periphery region. This outcome is not guaranteed, but depends on the relative amenity endowments of the two regions. For high amenity periphery regions, the model predicts an irreversible change in population location so that growth concentrates not in the core but in the periphery. On the other hand, periphery regions with moderate amenity endowments may gain some population and production, but will never develop into new core regions. Those regions with amenities below a certain value will fail to gain population, despite the core's degradation. Thus, rural regions may benefit from congestion and pollution in urban regions, but only if they have a sufficient "pull" of their own.

There is some scope for pro-active public policy to promote amenity-driven rural growth. Local government investment in amenities in the periphery region can attract population and production to the periphery, but only if the initial amenity endowment is relatively high and the utility gain from augmenting amenities exceeds the utility loss from additional taxation.

In support of the possibility of amenity-driven growth, I have invoked empirical evidence that wage premiums and discounts are associated respectively with low-amenity and high-amenity regions, and modeling results that identify conditions under which urban disamenities and rural amenities might eventually overcome urban production externalities, thereby reversing the pattern of urban growth and rural depopulation. In addition, there is some empirical evidence for amenity-driven growth. Rappaport and Sachs (2003) have shown not only that coastal counties in the US have experienced disproportionate economic growth over the last 80 or 90 years, but that their economic advantage has shifted in that time, with advantages in market access (e.g. seaports) becoming less important and advantages in amenities more important.

There seems little doubt that amenities matter to growth prospects and are becoming, if anything, more important. However, the potential for effective amenity-oriented growth strategies and policies is much less clear, given that much of what counts as locational amenities (mountains, lakes, the sea-coast, pleasant climate) in Blomquist *et al*. and Rappaport and Sachs are, from the local perspective, givens rather than variables responsive to policy.

5. Multifunctional Agriculture

Agriculture produces a broad array of valuable amenities in addition to commodity outputs. The concept of multifunctional agriculture (MFA) is intended to capture the valuable products, beyond food and fiber commodities, that come from agriculture (Nilsson *et al.* 2008). A list of these products might include open space, wildlife habitat, environmental amenities, recreation and tourism, rural community vitality, "natural" and organic food and fiber products, food safety and security, production using traditional methods and historical buildings and equipment, and cultural landscape. If commodity outputs alone were at stake, economists would argue, free markets would ensure their efficient production and pricing. The MFA concept has economic cogency when non-commodity outputs are valued but would be unpriced (or systematically underpriced), and therefore underproduced, in a free-market world. The economic argument for taking MFA seriously is a market-failure argument (Romstad 2004) – free markets fail to value non-commodity outputs fully, and thus to provide incentives for their optimal production – implying a role for public policy to

correct the market failure.

The market failure justification for MFA policy argues for treating place-based regional economic development policies as distinct from MFA, because they are not so readily justified by appeal to market failure. Therefore, I distinguish value-added agriculture and amenity-augmenting policies (which I will call MFA) from place-based economic development policies, because they have quite different rationales and, plausibly, different impacts on prospects for regional economic growth.[3] Both kinds of objectives are in fact supported by agricultural policies in the United States and the European Union (Cochrane and Wojan 2008). This section of this address is focused on amenity-augmenting policies, but place-based economic development policies are discussed in a later section.

Various US federal and state programs set aside land in conservation, wetlands, and grasslands reserves, subsidize environmentally friendly practices, support "natural" and/or organic production of food and fiber, and provide economic incentives to encourage agricultural and/or open-space uses of land. In the European Union, MFA objectives are supported by agri-environmental programs of many kinds, and programs to support structural adjustment in the farming sector, including investment aid. In both the US and the EU, traditional agricultural commodity programs also support MFA objectives (it is claimed), to the extent that they are defended as supporting rural communities and traditional values associated with farming (typically, the family farm in the US, and cultural landscape in Europe).[4]

Amenity-augmenting policies and programs for agriculture and rural regions expand the concept of agriculture to include production of various kinds of amenities. In contrast to commoditization, artisanal, regionally-branded, etc. food and fiber products are included in MFA, as are amenities associated with agriculture; and these approaches introduce prospects for enterprise diversification, improved viability of peri-urban farms, and perhaps improved regional economic viability (Clark 2009, and Clark *et al.* 2007).

However, it is important to recognize that there are perhaps major differences among regions in their potential to benefit from efficient MFA policies and programs. Regions vary in their potential for efficient amenity production, with regions high in natural amenities having clear advantages. Regions differ also in their remoteness from population centers. Remoteness always imposes costs, but there are differences among MFA products in the costs of remoteness – amenities that are consumed on-site are more disadvantaged by remoteness than differentiated products that can be transported readily. Randall (2002, 2007) has argued that differences in remoteness imply perhaps substantial regional differences in efficient green prices, more so for amenities consumed on-site.

6. Conjectures from the semi-popular literature

The "world is flat" hypothesis. The journalist Thomas Friedman has attracted much attention with his "the world is flat" hypothesis (2005). Basically, he has argued that the inexpensive transmission

3 I confess that the distinction I am making between amenity-augmenting policy (MFA) and place-based economic development policy is inconsistent with both US and European linguistic norms. US officialdom avoids the term MFA (perhaps for reasons rooted in international trade concerns – see Randall 2003, 2007) but recognizes the policy-relevance of payments for ecosystem services, and programs to promote local, natural, and organic foods as well as more generic access to a safe and healthy food supply. The US has its framework of rural development programs, too, but views them as quite distinct from the above MFA-like programs. It seems that Europeans are more comfortable than I am, with including place-based regional economic development policies in their notion of MFA.

4 See also the Special Issue Comparing US and European Rural Development Policies, *EuroChoices* 7(1). 2008. http://www3.interscience.wiley.com/journal/119421781/issue

of information allows effective economic competition from remote regions, an argument he presents in broad generalizations supported by anecdotal evidence. One imagines a lone individual in a remote village with a laptop computer recharged by a portable generator, possibly itself animal or human-powered, competing effectively in the global market for one or another kind of intellectual product. And perhaps so – there may be a sprinkling of such cases. But for regional economic development, we would need to imagine large information-based enterprises emerging in remote places with surplus labor, and competing effectively in global markets.

It can be argued that this hypothesis is plausible for work that is readily commoditized. However, most high-value work is not readily commoditized – Leamer (2007) proposes the following hierarchy from more to less commoditized: type this page; edit this page; write an article for an economics journal; write a good joke. For work that is not readily commoditized, it is reasonable to conjecture that agglomeration efficiencies, especially the deepening of the labor force, matter.

Post-industrial technology and "the rise of the creative class". Agglomeration efficiencies are unlikely to diminish in the post-industrial age, and post-industrial technology tends to widen the value gap between creative and commoditized work.

The "rise of the creative class" hypothesis (Florida 2002) suggests that cities can prosper by sustaining an urban environment attractive to creative workers. The creative class hypothesis adds to the deepening labor force argument by suggesting that creative workers choose locations with a high level of urban amenities. The hypothesis is that regional development now depends on novel combinations of knowledge and ideas, that certain occupations specialize in this task, that people in these occupations are drawn to areas providing a high quality of life, and thus the essential development strategy is to create an environment that attracts and retains these workers.

Attention tends to be focused on two distinct aspects of the creative class hypothesis, for quite different reasons. First, what defines the set of creative workers? The tendency is to focus on certain occupational and professional groups rather than, say, certain sectors of the economy, or the higher-wage strata (as one might, if one were identifying high levels of human capital). This latter distinction matters, if the aim is to test the creative class hypothesis vis-à-vis the less controversial claim that concentrations of high-human-capital workers tend to attract innovative firms to a region. Second, the distinction between the creative class hypothesis and the labor force deepening (i.e. high and extensively differentiated human capital) hypothesis acquires heightened significance in the context of America's "culture wars". A creative class sub-text that the gay community includes more than its share of creative workers, and therefore should be courted rather than repulsed by economically-ambitious cities, tapped into a contemporary US political controversy, as laws perceived as anti-gay were proposed and passed in some cities and states.

7. Post-industrial technology, the "creative class" hypothesis, the "world is flat" hypothesis, and amenity-driven growth – empirical evidence

Post-industrial technology is less dependent on *in situ* resources, value is provided less by bulky commodities and more by technologically sophisticated products and services and information substitutes in considerable degree for transportation. So, intuition suggests that workers and their employers face lower cost-penalties for locating in remote regions. The "creative class" hypothesis, the "world is flat" hypothesis, and the amenity-driven growth hypothesis all depend on the idea that the grip of distance on economic prospects is loosening.

The creative class hypothesis. Empirical evidence re the "creative class" hypothesis is mixed and controversial (McGranahan and Wojan 2007, Boschma and Frisch 2007, Gabe *et al.* 2007, and Hoyman and Faricy 2009) – and much of the controversy surrounds the appropriateness of definitions and adequacy of measures of the creative class.

McGranahan and Wojan report a series of empirical studies of recent economic development performance in US rural and urban counties. Among their results, we find that creative class presence supports economic growth and is associated with high levels of natural amenities in rural counties. In urban counties there is a strong association between creative class presence and growth, although the association with natural amenities is not so strong. However, as the authors report, these results are sensitive to the definition of the creative class: "… the results depend on a recast creative class measure, which excludes from the original Florida measure many occupations with low creativity requirements and those involved primarily in economic reproduction. The measure conforms more closely to the concept of creative class and proves to be more highly associated with regional development than the original Florida measure."

Boschma and Fritsch test the creative class hypothesis with data on regional growth in Europe. They, too, define the creative class in terms of professions not industries. Findings include: the presence of the creative class is positively associated with regional economic growth; health care and education facilities have only modest association with presence of the creative class; and the regional share of the creative class among the labor force is positively associated with a climate of openness and tolerance – urbanization *per se* is not enough.

Hoyman and Faricy, and Gabe *et al.* are less inclined to endorse the creative class hypothesis. Hoyman and Faricy, analyzing data from 276 US metropolitan statistical areas, report that the presence of the creative class is not related to growth, whereas human capital predicts economic growth and development, and social capital predicts average wage but not job growth. Nevertheless, they found that clusters of universities correlated highly with economic growth. They do not shy from policy recommendations, warning against the use of "creative class" strategies for urban economic development. I suspect that different definitions of the creative class help explain the very different conclusions of Hoyman-Faricy, compared to McGranahan-Wojan and Boschma-Fritsch; and I am not sure what exactly it means to conclude that high human capital and clusters of universities help economic growth but the creative class does not.

One way or another, it seems that all three categories (high human capital, the talent attracted by clusters of universities, and the creative class) are associated with the deepening of the labor force, so the deepening hypothesis is not rejected. On the other hand, empirical correlation between deepened labor force and economic growth is not enough to establish that policies targeted to attracting high-quality workers constitute an effective development strategy, or to determine what kinds of amenities are most effective at attracting the right kinds of workers.

"The world is flat" hypothesis. "The world is flat" hypothesis – that information technology has lowered the costs of distance and hence the economic penalty for remoteness, dramatically expanding the set of effective competitors in global markets and equalizing the playing field – has intuitive appeal and some anecdotal support. Nevertheless, despite Friedman's hypothesis that distance matters less in the information age, the long-established empirical result that bilateral trade volume decreases with distance seems secure. Disdier and Head (2008) completed a meta analysis of 103 published studies, and concluded that the estimated negative impact of distance on trade increased around the middle of the twentieth century and has remained persistently high

since then. Furthermore, at the regional level, empirical research on growth shows that distance still matters in Europe (Basile 2008) and North America, and its importance may be increasing over time (Partridge *et al*. 2009, 2008).

If anything, the work of Partridge and colleagues shows that proximity within the urban system plays a stronger role – stronger than other factors such as market potential and amenities, and growing stronger over time. Fast-growing small cities and rural regions tend to be accessible to large and/or fast-growing cities and, overall, the hinterlands' population appears to be redistributing itself to be *nearer* to, if not exactly *in*, larger urban centers. At the intra-regional level, there is evidence suggesting that information technology complements rather than substitutes for face-to-face interaction. For example, Sohn *et al.* (2002) report that in the metropolitan Chicago region information technology has contributed more to concentration than to dispersion of the urban spatial structure.

How are we to reconcile agglomeration effects, which are large and apparently growing, with Friedman's premise that the costs of distance are decreasing? While it makes sense that agglomeration matters more to high-value work, it is not unimportant to work that seems readily commoditized. Furthermore, commoditization seems to be a matter of degree: while routine tasks in the manufacturing of clothing have been outsourced successfully to remote places with very low wages, the outsourcing of relatively mundane work in information processing has benefited entrepreneurs in the agglomerated cities of Bangalore and Hyderabad much more than independent contractors in remote regions.

Amenity-driven growth. As reported above (Section 4), anecdotal evidence and theoretical modeling support the possibility of amenity-driven growth, at least in favored locations. Partridge (2008) regards such cases as exceptions to the general rule (supported by his extensive empirical research) that proximity more than anything else drives growth and its influence is if anything increasing.

From an American perspective, this raises a conundrum. In the post-war period (more than 60 years, now), changes in the distribution of population and income have been rather dramatic, and the big continuing trends have been the increasing concentration of population in the coastal regions, the mountain west, and the south (Rappaport and Sachs, 2003). Coastal and mountain regions are considered high-amenity *ceteris paribus*. The south enjoys more hours of sunshine than other regions, and electric air conditioning has reduced the cost of dealing with unpleasantly warm conditions whereas there have been no comparable advances in accommodating snow and ice in the north. So, a plausible story can be told of sweeping multi-generational trends in the distribution of the US population toward places and regions that enjoy amenity advantages.

During this long post-war period, several major cities in the south and the mountain west (e.g. Atlanta, Denver, Phoenix, San Diego) have emerged as centers of thriving economic regions. Whatever the natural and amenity advantages of these sites, at some point agglomeration kicked-in, and the endogenous growth dynamic took over.[5] Over the long haul, remoteness is endogenous – some remote places become central and some places that used to be central are at risk of becoming remote. Suffice it to say that our understanding of the influence of amenities on economic growth seems incomplete.

5 Krugman (1993), addressed the flip-side of this question – how can Chicago's regional pre-eminence be explained, when it seems to have enjoyed few natural advantages? Using a general equilibrium model he concludes that, while concentration could have occurred at any of several sites, once it occurs the endogenous growth dynamic is self-reinforcing.

Perhaps there are some time-inconsistencies in the evidence and/or our interpretation thereof.

An intuitively appealing generalization is that distance, or conversely proximity, always matters to growth prospects whereas natural amenities may provide opportunities for favored places and regions, and cities that strive to maintain a high level of urban amenities may be rewarded.

Because agglomeration matters less for consumers (e.g. the internet is an efficient provider of a broad suite of consumer amenities) than for firms, it can be argued that amenity-seeking consumers will be less disadvantaged by remoteness. Such consumers will include some who can use information technology to work remotely, but perhaps even more whose income is independent of their labor contribution. Intuition suggests that retirees are likely to be over-represented among footloose amenity-seeking consumers, and some favored communities will be able to prosper by attracting more than their share of economically-independent retirees. But, again, evidence is mostly anecdotal rather than empirical and systematic.

8. Persistent spatial inequalities and place-based policies

Income differences may exaggerate the magnitude of spatial inequalities in economic well-being – lower housing costs, lower taxes, and higher amenity levels are just three of the things that would raise "full income" for some households in relatively remote regions. Nevertheless, spatial inequalities are real and more persistent than standard economic theory would predict. Place-based economic development policies are often invoked to address persistent spatial inequalities.

While the political system (itself place-based – electorates are defined spatially) continues to support them, the consensus among economists In the US is that place-based economic development policies are mostly ineffective. The World Bank (World Development Report 2009) takes a similar position on a global scale – place-based policies are wasteful and run counter to spatial efficiency.

In the European Union, place-based policies enjoy political support (European Commission 2006), and the EU maintains a considerable slate of rural development policies and programs (Cochrane and Wojan 2008). There is a diversity of views among economists as to the justification and effectiveness of these policies (Bureau 2008, Winter 2008).

Some empirical evidence can be brought to bear, regarding the impacts of these policies and programs. Inter-regional fiscal transfers have long been used in the EU to encourage economic integration of lagging regions. Checherita, *et al.* (2009) examined evidence on the role of net fiscal transfers to households and EU structural funds for per-capita output convergence across a large sample of European regions during the period 1995-2005. They found that net fiscal transfers, while achieving regional redistribution, seem to impede output growth and promote an "immiserising convergence": output growth rates in poor receiving regions decline by less than in rich paying regions. EU structural and cohesion funds spent during 1994-1999 had a positive, but slight, impact on future economic growth, mainly through the human development component. Their summary finding is that the major place-based economic development policies in the EU have reduced regional income disparities but not disparities in output per capita.

Given that EU economic integration facilitates trade and encourages foreign direct investment (FDI) flows among member countries, Borota and Kutan (2008) investigated the impact of the trade and FDI variables on the growth performance of the EU-15 group. They report no evidence

that trade and FDI have reduced disparities in capital formation. However, there is evidence that net FDI inflow has accelerated technology transfer, suggesting that FDI has served mostly as a special channel for technological transfers. While regional disparities in capital formation within the EU persist, to the extent that the EU integration has caused higher FDI inflows in lagging regions, it is clear that this process had a beneficial impact on growth via technology transfer.

These recent studies can be interpreted as providing only weak support for place-based economic development policies in the EU. Transfers raise incomes in lagging regions, but lower incomes by a greater amount in net-payer regions; in lagging regions, fiscal transfers have raised incomes but not output; and foreign direct investment in lagging regions has not reduced disparities in capital formation, but it has served as a vehicle for technology transfer.

9. Conclusions

The above review supports some broad-brush conclusions about multifunctional agriculture and economic development in rural regions. I begin with two stylized facts and draw-out some of their implications, and then conclude with some implications for the potential contribution of multifunctional agriculture to regional economic development.

Stylized fact 1: Ideal MFA policy is mostly about correcting market failures, and is desirable for all the usual economic reasons (Randall 2002, Romstad 2004). MFA policy has the potential to internalize the negative externalities from agriculture, and to provide and/or enhance open space, wildlife habitat, environmental amenities, recreation and tourism, differentiated food and fiber products (e.g. locally produced, "natural", and organic), food safety and security, production using traditional methods and historical buildings and equipment, and cultural landscape. To the extent that it actually corrects market failures, MFA policy will improve quality of life, well-being, and perhaps incomes in many if not all rural places (farms and villages), regardless of location.

Stylized fact 2: Distance still matters, and conversely remoteness remains an impediment to growth (Partridge *et al.* 2008, 2009). Thus far, the evidence fails to support claims that the "creative class" and "world is flat" hypotheses offer systematic antidotes to the tyranny of distance.[6] Amenity-driven growth is possible but does not offer a general panacea. High levels of natural amenities, and/or educational and cultural amenities may bring prosperity to some favored places. There are many examples of smaller US cities that seem to be thriving because of environmental amenities (Coeur d'Alene ID, and Sarasota FL), high levels of educational and cultural amenities (Charlottesville VA), or both (Missoula MT). However, it is not clear that college towns and places with natural amenities have in general excelled in economic growth.

It follows directly from the tyranny of distance that, for regions seeking sustainable prosperity, there are few quick fixes. Given that remoteness is exogenous in the short to medium run, the most promising strategies seek to generate a regional advantage in performance of high-value work, and involve long-term, sustained focus on education, infrastructure, quality of life, and favorable economic and fiscal policies.

Now we consider some implications for the potential contribution of multifunctional agriculture to

6 It seems not entirely a matter of happenstance that the historian, Geoffrey Blainey, who coined the term "the tyranny of distance" is Australian.

regional economic development.

MFA and regional development objectives (1). Consider ideal MFA policy as addressed to correcting market failures, and assume MFA increases amenities in rural areas. What regional growth response can we expect? It seems the growth response will vary by region and locality, and will depend on amenity level and remoteness:

- MFA will enhance opportunities for farmers on the urban fringe. In the US, Clark (2009) has documented a high level of specifically peri-urban adaptations, including urban-oriented marketing efforts and adjustments to accommodate new urban neighbors. For peri-urban farms, diversification is often a viable strategy for farm survival, and is valued for its contribution to quality of life; and its value is likely to increase as the markets for locally-grown and regionally-differentiated agricultural products grow. Nevertheless, the stand-alone contribution of MFA opportunities at the urban fringe to big-picture economic competitiveness is probably rather modest.
- MFA may provide fertile opportunities for growth in high-amenity rural regions accessible to centers of agglomeration that offer opportunities for high-value work.
- MFA may generate growth in relatively remote high-amenity regions, especially in-migration by consumers who are less disadvantaged by distance. Such consumers are often (but not always) retirees, which has obvious implications for the age structure of the local population and the kinds of urban services that that will experience growing demand. If pensions are received independent of current place of residence, local expenditures of retirees serve an economic function similar to remittances.

MFA and regional development objectives (2). Assume the goal is effective place-based economic development strategies. As noted above (footnote 1), the European concept of MFA policy includes some place-based economic development programs. However, there are limits to the optimism that should greet such policies. According to a fairly firm consensus among economists, supported by the smattering of empirical evidence that exists, place-based economic development policy has its own serious limits.[7]

The scope for MFA policy (as I have defined it here) in service of this objective is limited. Remoteness is non-responsive to policy in the short-medium term, and the amenities that attract high-value workers and foot-loose consumers include many that are relatively non-responsive to policy – proximity to sea, lakes, mountains; pleasant climate; etc. Basically, amenity-oriented policies, including MFA, are likely to more effective in stimulating economic growth in the "silk purse" locations than in the "sow's ears".[8]

A wild card: bio-energy and carbon sequestration may substantially increase farmland rents. As this is written, dramatic new policy commitments to green and renewable energy and sequestration of greenhouse gases are emerging, and seem likely to raise rural land rents, food prices, and transportation costs. Impacts of these developments on the regional and intra-regional dispersion of population and economic activity are, of course, speculative. We might expect labor employed in agriculture to increase somewhat, but not as much as land rents; and this increase would likely be concentrated in regions that were marginal for agriculture in the absence of these new energy and carbon related opportunities. We might expect any growth from this source in remote areas to be

7 This conclusion seems to be congenial to the World Bank (2009), which points to inter-territorial migration as the solution – people will develop even if many places don't.

8 "You can't make a silk purse out of a sow's ear" – attributed to Jonathon Swift (1667 – 1745).

offset by increasing costs of remoteness as transportation costs increase (and the rise in transportation costs will be tempered by increases in fuel efficiency). The potentially negative impact of increasing land rents on economic development is likely to be rather restrained: urban and recreational uses of land seem able readily to outbid agriculture, and it is perhaps unlikely that agricultural rents will rise enough to reverse that situation. But, as I indicated, all of this is speculative.

I conclude by returning to a point made earlier. Market-failure-correcting MFA policy will improve quality of life, well-being, and perhaps incomes in many if not all rural places regardless of location. And this accomplishment, should it be forthcoming, is not trivial – economic growth for all regions regardless of resources, amenities, and remoteness is simply not on the cards, and regions in decline face daunting problems maintaining essential services and quality of life (Kilkenny 2010). Growth is not everything – regions unlikely to experience growth need to create satisfying futures.

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UNDERSTANDING THE DEMAND SIDE AND COORDINATING THE SUPPLY SIDE FOR CONNECTED GOODS AND SERVICES

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Abstract

This paper addresses the coordination and innovation issues needed for promoting value added at the rural and regional level. There are two sides to value added: the ability to meet consumer demand, and to identify least cost ways of supplying the demanded goods. Human and social capital play an important role on both sides.

At the municipality level the supply side issues are complex. First, because the production space has far more dimensions than for the single entrepreneur. Second, because the value of some goods and services produced depend on what other goods and services that are available. On the supply side networks are important to solve the coordination issues, while networks for identifying and understanding consumer preferences are important on the demand side. Participation in these two network types compete for the same scarce resource, the time of the inhabitants of a municipality.

We address these issues in more detail. A major insight from our work is that in addition to the time conflict, innovation and new information may make it more difficult to maintain coordination networks.

Key words: regional development, multifunctionality, municipalities, demand, coordination, networks.

1 Introduction

This paper deals with how competitiveness and welfare can be enhanced at the municipality or regional level[2]. To be competitive is to deliver demanded goods and services at prices that attract customers. That requires understanding both the demand and supply side of an economy. At the community, municipality or regional level the opportunity set is far larger than for an individual producer for several reasons. First, the amount of skills and knowledge among a collection of producers is far larger than for a single producers. Second, the variety of resources is higher. This implies that the production possibility set spans more dimensions at the community level than what is the case for a single producer. However, while the supply side opportunities are larger, there are also some challenges. Before moving to these, we will have a closer look at the demand side – a much neglected issue in rural (and regional) development.

Our stratified Google search on "rural development" with the exact phrase "demand analysis" only produced one peer reviewed article published after 2000, namely Getz and Brown (2004). In their paper on the demand for wine tourism they report that long distance traveling wine tourists look for wine growing areas that also are known for scenic beauty and offer a multitude of leisure activities. We think this emphasis on multiple options is not

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2 For the reminder of this paper, the terms *community level*, *municipality level* and *regional level* will be used interchangeably.

unique to wine tourists as our little tale below illustrates.

Imagine a family of four consisting of two adults and two children on vacation by car. For simplicity and without loss of generality let us call them Hansen. After having been stuck together in the same car for three to four hours with the exception of some short breaks, they start to be pretty fed up with each other, and now they are looking for a good place to stop and have a break from each other. As many modern households the Hansens have diverse interests. They are therefore more likely to stop on a place that offers activities that cater to their diverse demands. Mr. Hansen dream about two to three hours of peaceful fly fishing, while Mrs. Hansen is looking for a place with art galleries and antique shops. The children, one boy and one girl, also have different wants. The teenage son looks for a place where he could play some sports, like a friendly pick-up game of soccer or basketball, while the daughter wants to go horseback riding. Now suppose they found some place that in a credible way offered these activities in a safe environment, i.e., it is possible to let the children loose. It is far more likely that they would stop at such a place rather than at a place which has less to offer. If the Hansens were well organized and structured, they would most likely have sought such locations out on the web before starting on their journey.[3]

After two to three hours of being apart the Hansens reconvene. Hopefully, all are rested and ready to enjoy being together again. If they enjoyed their activities, it is not unlikely that they would like to repeat the activities the morning after. They would then be looking for a place to have a nice dinner, and maybe spend the night in the vicinity. This is were the "big money" are spent, i.e., some local businesses are really going to make a profit. However, the profits enjoyed by the restaurant and lodging providers are not only a result of their actions. After all, the Hansens may not have stopped if it had not been for the fly fishing, the art galleries and antique shops, the local sports facility where some other children were playing pick up games, and the riding center.

While too many regional and rural development strategies focus mainly on the supply side, we think social welfare is further enhanced if one is able to see supply and demand together. This holds for the local business benefits and consumer satisfaction. In our tourism tale it is easy to see that it is the municipality's ability to meet consumer demands that determine the level of success of the businesses. This ability increases if there is cooperation among the local businesses in terms of marketing, in particular with increased use of the web for planning tourist activities. But marketing is one thing, being able to meet the demand is another issue.

Some interesting and complicated issues quickly arise in our setting. Suppose that some of the activities that made the Hansens stop, for example the art gallery, were not profitable by themselves. Could the local restaurants and lodging facilities increase their profits by offering some side payments to non-profitable activities that increase the chances someone will choose to have dinner and spend the night?

We will therefore look at various ways at which local businesses may become more able to meet the demand challenges. While the relevance of our perspective is most easily seen for activities related to tourism, we think the potential of coordinated action and networks go beyond the tourism sector. Networks can be separated in two main purposes: (i) *coordination*, and (ii) *exploration and innovation*. These two network classes differ substantially in their basic characteristics, but have one common feature – they both compete for the entrepreneur's time together with the time allotted to run the business. Here, it should be noted that these two roles already are recognized in the rural development literature (see for example Léon 2005).

3 Please accept our apologies for the stereotypes this imaginary family portrays. Our main point is to illustrate that modern families are diverse in their demands, and that even on vacations, they would like to be able to pursue some of their individual interests.

Section 2 looks at the supply side when multiple products are produced, while Section 3 analyzes the coordination issues using some stylized models. In Section 4 we look at networks as one way of resolving the coordination issues before Section 5 concludes.

2 Multi-product production at the regional level

This section starts with multi-product production at the firm level using a multifunctionality approach that is quite well known in agriculture. We then extend the firm level analysis to the municipality level, before we summarize the supply side issues, and look at interactions with the demand side.

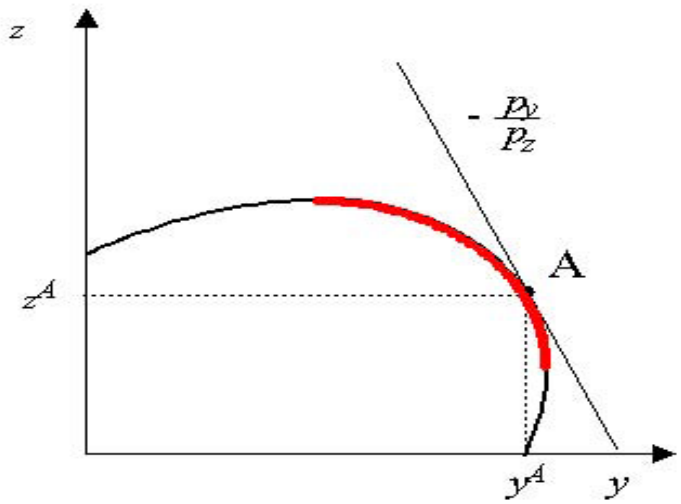
2.1 Multifunctionality as we (ought to) know it

Romstad (2008) argues that multifunctionality basically is multiproduct production for a given resource or cost base, *C*. This is a very standard approach in production economics that is described in several books (see for example Debertin 1986; Chambers 1988). This gives the familiar production possibility set, where optimal allocation implies that the rate of product transformation equals the negative slope of relative price line, i.e.,

$$RPT_{yz} = - py / pz \qquad [1]$$

Figure 1 provides a graphical illustration.

Figure 1 - The production possibility frontier and the optimal allocation.



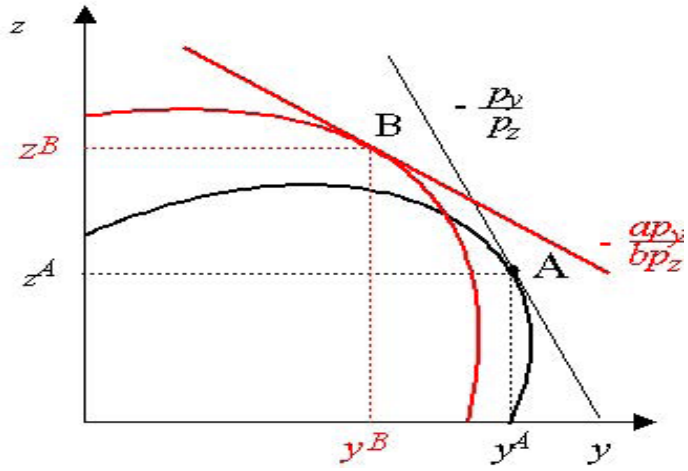
Note that all joint pairs (y, z) on the production possibility frontier (the product transformation curve) can be achieved with the same costs, C. For positive prices on y and z the profit maximizing allocations must then be located on the thick portion of the production possibility frontier[4]. It follows from [1] that prices provide information to producers on how much to produce of each commodity.

Following Romstad (2008) we briefly turn to production in the longer run. Suppose that due to changes in consumer preferences the relative price between y and z changes so that py/pz decreases,

4 While this brief analysis assumes revenue maximization for a given costs, it is easy to see that allocating production resources so that [1] holds makes it easier for any producer to avoid running a deficit.

i.e., it becomes more profitable to produce z at the expense of y. Moreover, assume that this relative price change is expected to last (for some time). This could trigger innovation that changes the production possibility set. Let the new price change be given by , apy/bpz where $a < 1$ and $b > 1$. Figure 2 provides an illustration.

Figure 2 - Perceived changes in the shape of the production possibility set from a perceived long term price change.



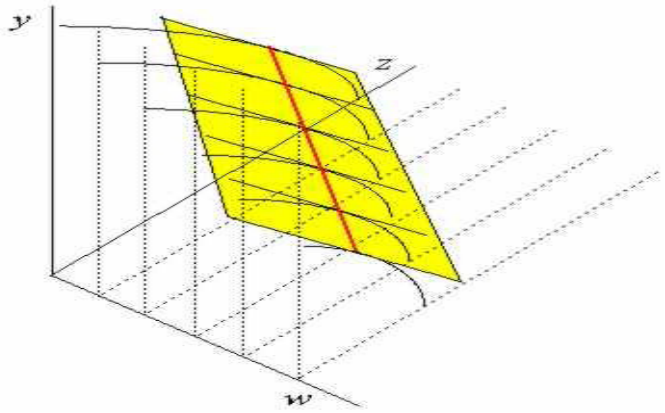
The perceived changes in the production possibility set in Figure 2 does not happen instantaneously. Replacing old technology with the new is a gradual process. Johansen (1972) refers to this gradual adoption of new technologies as the *putty-clay* model of production. That is, as production possibility sets change over time, they are "pulled" by what appears to be the relevant price changes.

An entrepreneur who is concerned about maximizing his expected profits will consider various options and allocate his or her resources, including time, so that the marginal value of each input used in the production process is equal at the margin (the last unit produced). The extent (size) of the operation will be determined by constrained resources (like available land of suitable quality), and the size of production possibility set.

2.2 Multifunctionality at the community level

Multiproduct production at the community level follows the basic same economic principles as for the entrepreneur, but there are some notable additions. For one, the availability of resources (including time) increases significantly. Second, the number of options, i.e., the dimensions of the production possibility set increases. Figure 3 provides an illustration of an expansion from Figure 1 by adding a third dimension, w.

Figure 3 - The impact of optimal allocation of adding products



When the production possibility set from Figure 1 is expanded with one more dimension, *w*, the optimal allocation of *y* and *z* may also change. Figure 1 can basically be seen as one of the curves in Figure 3 where *w* is fixed at some level, *w*, usually zero. As *w* is increased revenues also grow, but the strain on available resources that previously were allocated to only two products also increase. The optimal allocation in this case is now determined by the tangency of the (yellow) plane in *yzw* space to the frontier of the three dimensional production possibility set.

At the municipality level the number of dimensions will be much larger, but the same basic principles apply, i.e., in optimum marginal costs for all inputs are the same evaluated at the chosen allocation, which again are equated with the marginal revenues (the prices in the case that the producers in the municipality produces so little of the chosen products that market prices are not affected). A notable feature in this connection is that as the product range changes, so could the expected payoffs of the other products.

The possible high number of products offered at the municipality level makes the production decision far more complicated than for the single entrepreneur, in particular if we look back at our starting example with the Hansens. An additional complicating with the Hansen example is that the prices that some producers may be able to charge varies depending on what other products that are available. Going back to the basic exposition surrounding Figure 3, this implies that the hyperplane may not be linear, but curved. Another feature is the need for coordinated action as recognized in several works on rural development (see for example van Huylenbroeck Durand 2003; Kydd and Dorward 2004).

3 The coordination problem

Coordination problems take many different forms. In the rural (and regional) development literature it is well recognized. A typical example is the impact of infrastructure on the viability of businesses. In our setting the coordination problem takes a different form – the actions of some producers may cause positive or negative externalities on other producers (see for example Baumol and Oates 1988 for an overview).

There are several ways of correcting externalities pending what kind they are. The standard eco-

nomics approach is that some central agency introduces a set of taxes or tradable permits that create a price on the externalities (Baumol and Oates *ibid.*). Others, with Ostrom (1990, 1995)[5] being the most known proponent for this view, argue that agents are able to self organize to lower transaction costs and solve coordination problems at the local level.

3.1 Externalities and a benign dictator

One way to overcome the coordination and pricing issue of externalities is to assume a benign and well informed dictator who controls the whole municipality. This dictator seeks to maximize social welfare for the municipality as a whole. Any externality will then be internalized. Moreover, the dictator is well informed about the internal demand in the municipality and demand from nonresidents. Hence, the dictator allocates resources so that a Pareto-optimum is reached from the perspective of the municipality.

3.2 Coordination among independent agents

The benign dictator is a theoretical construction. Nobody possesses perfect information about the preferences of all people in a (local) community, but as a yardstick the dictator allocation is interesting. A central question is how can we replicate the resource allocation of the benign and well informed dictator.

In the absence of externalities, complete and perfect markets we know that a Walrasian exchange economy also will result in a Pareto-optimal allocation (for an overview see Varian 1992). In our setting these requirements are unlikely to be met. This is the case if some of the goods demanded public, i.e., they are non-rival and non-exclusive in consumption (Randall 1982). Landscape amenities[6] like scenic beauty or habitat for wildlife are examples of such goods. From the only peer reviewed published study we found (Getz and Brown 2004, on wine tourism) we know that landscape amenities are important when some tourists choose where to go on vacation. A Walrasian exchange economy[7] is therefore unlikely to produce a resource allocation that will result in social welfare maximization.

Seabright (1993) presents an overview of the incentive issues related to local commons. Here, we limit our exposition to discussing three main approaches. The first (and obvious) solution in the case of providing positive externalities is to have those benefiting from the supply of a non-market good pay for it through some contractual arrangement.

Flat rate payments where any supplier who accepts the contract terms is compensated. One problem with this approach is that it may result in over- or under-supply as the buyer does not know the costs of providing the good in question. Consequently, the buyer cannot know if the contracts have been allocated to the least cost providers if the buyers' budget is exceeded.

Auctions is another way of having such contracts allocated to the least cost providers. Usually, multiple contracts will be allocated. This renders ordinary auctions of little use as they are prone to strategic bidding. To see this consider that each provider is paid according to his or her bid. A potential provider who is reasonably certain he is of the low cost may gain from raising his bid somewhat. Then the bids will not represent the true costs of meeting contract terms, and contracts may be allocated to the least cost providers (Romstad 2009). Some concerns have been raised

5 Other accessible works by Ostrom and coauthors on these issues include Ostrom and Gardner (1993) and Dietz, Ostrom and Stern (2003)

6 Randall (2002) discusses the challenges of valuing landscape amenities.

7 Some times the term the *Walrasian auctioneer* is used (see for example Kranton and Minehart 2001).

related to the ability of decentralized decision schemes like auctions to achieve spatial coordination (an issue of concern for landscape amenities), but incentives in auctions can be formulated to solve these issues (Parkhurst *et al.* 2002; Warziniack *et al.* 2007).

A uniform price auction[8] does not suffer from the same problems of potential providers not bidding their true costs. Polasky and Romstad (2009) show how such an auction can be designed to allocate forest management contracts for biodiversity conservation purposes. Their approach is also applicable for the allocation of multiple management contracts in other settings, for example if a hotel owner would like parts of an area to be managed to enhance the scenic beauty of the landscape.

A third type of *side payments emerge from direct cooperation* in what is termed cooperative games. While cooperative game theory may provide an avenue for resolving some coordination issues within municipalities, it suffers from one major problem: The pre-cooperative phase is non cooperative, and that there exists no standard approach of telling what will be the cooperative outcome, if any (Gibbons 1997)[9]. Moreover, we know at at the municipality level there already exists various forms of cooperation.

At this stage, however, we return to the perspectives of Ostrom (1990, 1995), which brings us to networks, self organization, and social and human capital.

4 Social and human capital: benefits and liabilities of social networks

Social capital is defined as the potential resources embedded in a social network, that can be mobilized to facilitate actions (Adler and Kwon 2002). Social capital has shown to represent benefits for a focal actor as a member of the network, such as firm start-up success (Gordon *et al.* 1997), and also for the network as a whole, e.g. through facilitating cost-effective transfer of complex information and tacit knowledge (Hansen 1999). Basically, the sources of social capital are the actors in the network (the human capital) and the relationships between them (defined as ties). The motivation for network participation stems from the potential resources the network represents for the focal actor. These resources – the social capital – are categorized into three main groups: information, influence and solidarity (Adler and Kwon 2002).

A major issue within social capital research has been to investigate the structural form of different types of networks and how these affect the size or strength of social capital embedded within it (Gabbay and Leenders 2001). Knowledge on what types of networks that produce the largest social capital will enable economic actors to carefully build and sustain optimal networks for their specific resource needs. There are two main views in the literature on what kinds of networks structures that produces most social capital (Gabbay and Leenders, *ibid.*; Gargiulo and Benassi 2000). One is the closure argument, predicting that dense networks with strong ties and a high degree of interconnectedness to a larger degree will produce social capital in the form of trust, norms of cooperation, which mobilizes collective action. The other view is that large networks of weak ties, with many "structural holes" represents more social capital for the actors, specifically for actors who are in the position to bridge structural holes of information (Burt 2001).

Several scholars have however pointed to the fact that networks not only produce benefits for the actors, but are also associated with costs, risks and social liabilities (Hansen *et al.* 2001; Portes

8 Uniform price auctions are a variation of Vickrey's (1961) second price auction.
9 See also Romstad (2005) for an accessible overview on these issues.

1998). For example, Hansen and colleagues (1999) found that some teams with many external ties used too much time to maintain these ties and hence performed their tasks slower. Portes points to the fact that mobilizing other network contacts to provide help, support or information may be costly, and that institutionalized networks have norms of reciprocation, so some actors may have large "social depth", which restrains behavior and induces costs (Portes 1998; Ladegard 2006).

Introducing a task contingency perspective, Hansen and colleagues (Hansen *et al.* 1999) argue that the benefits of different types of ties and network structures depend on the task at hand. Studying information and knowledge transfer, they found that teams that performed product development tasks (defined as knowledge exploration tasks), needed rich and diverse information and hence benefited more from a large external network. For teams with knowledge exploitation tasks, however, specific and non-redundant rather than diverse knowledge is needed and the costs of a large external network outweighed the benefits. This study shows how networks may represent different social capital for different tasks, and hence provides knowledge on how a local group of producers may use networks to pursue marked needs.

Taking the Hansen family example again, the different needs of the family members require cooperation, coordination and seamless "packages" of services to the family, that we denote the *coordination tasks*. These tasks require trust, collaborative norms, and low transaction costs between the producers, and thus points to a dense network with strong ties. This kind of network produces strong goodwill, and hence social capital benefits for the individual actors, as well as low transaction costs.

However, the whole idea of providing services and products to a market requires some sort of "*exploration tasks*", i.e., product and service development, innovation, and continuous market adjustment. These kinds of tasks require diverse and rapid development of new knowledge, and rich external information from markets and potential customers. Therefore, the exploration tasks call for a large network with weak ties and rich in structural holes, to be able to span a large amount of information, diverse information and market changes. This kind of network structure provides the actors with social capital in the form of novel and relevant market information, as well as innovative opportunities.

Similar, but opposite arguments can be formed for the costs or liabilities of the two types of network structures. A small network with strong ties has a high degree of closure, and little external information is channeled into the actors in the network. Thus, this network will represent liabilities for each actor towards the other actors, and may hamper individual actors' attempts to pursue product development or other individual changes in products and services. Further, a network with high closure is propounded to ignore external information, and therefore become production rather than market oriented. As the strong ties and mutual liabilities between the actors also restrain individual deviant behavior, this kind of network will probably over time have difficulties to respond to market demands.

The large and diverse network with many external ties, however, will represent costs in the form of time spent to maintain these relationships, time that is taking attention away from the core business. The time factor may also force actors to allocate less attention to the other producers in the internal network and may result in opportunism and larger coordination costs between the producers. Moreover, the allocation of large resources to shifting market needs may lead to ad-hoc adjustments, reduce focus on long term strategies, and also a loss of focus on identity and the distinctive character of the local products and services.

Therefore, the pursuit of benefits from human and social capital in local network of producers requires careful considerations of the benefits as well as liabilities of different network structures. The benefits and liabilities discussed above are summarized in Table 1.

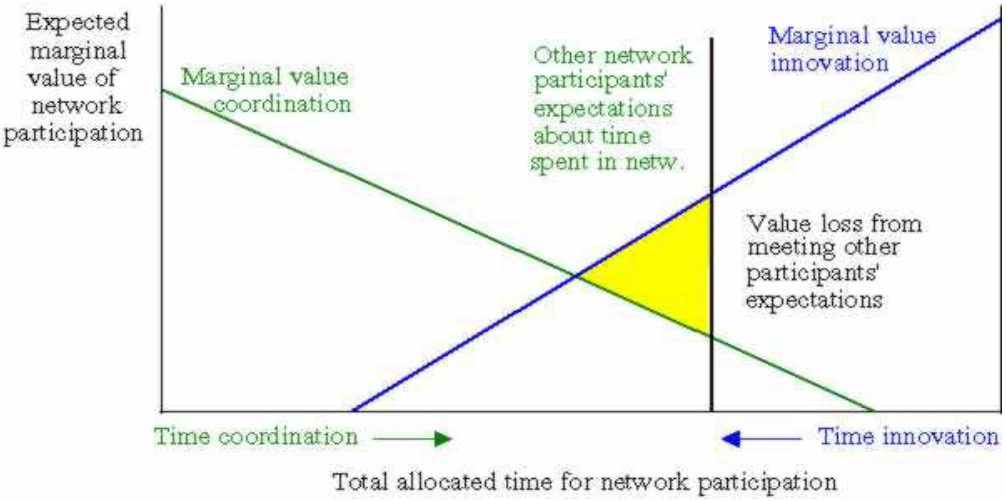
Table 1 - Social capital and social liabilities of different network structures

	Dense network, strong ties, high degree of closure	**Large network with weak ties and structural holes**
Benefits	*Coordination benefits:* 1 Seamless packages of services and products 2 Reduced transaction costs *Goodwill benefits:* 3 Governed by shared norms, less control needed 4 Help, support and solidarity	*Knowledge benefits:* 5 Responsivity to market needs 6 Knowledge about new products, services, competitors *Innovation benefits:* 7 Diverse information from many sources 8 Individual initiatives drives development
Costs and liabilities	*Narrow focus on production* 9 Irresponsive to market needs 10 Ignorance about competitors *Strong collective norms* 11 Restraint on individual behavior 12 Liabilities in the form of reciprocation of favors and help	*External focus* 13 Loss of identity 14 Time allocated away from core activities *Lack of coordination* 15 Individual initiatives may undermine the collective packages 16 Increased opportunism and transaction costs

Table 1 shows the main factors to consider when building local networks of producers. The importance of the different parameters will differ according to the nature of the products/services as well as the market. Some product/service packages are for example heavily tradition bound, and innovation efforts must always take into account the effects on the local identity of the products and services. If this is the case, it will be important to form networks with strong ties to at least some actors with extensive local knowledge, to secure goodwill from these sources.

Participation in networks requires time, which is a scarce resource. Forming well founded expectations about the benefits of participating in the two network types are important to be able to allocate (the scarce) time in an appropriate way. These matters are not made easier by the fact that coordination networks often require some minimum commitment for the network to serve its coordinative purpose. Figure 4 illustrates this scisma, which here leads to a loss of value (the yellow area) because of other network participants' expectations about time committed to the network.

Figure 4 - Time allocation between coordination and innovation networks



Optimal allocation of the total time takes place where the marginal value of time participating in the coordination network equals marginal value of time participating in the innovation network. Figure 4 depicts what we perceive to be a frequent occurrence – value gains are to be made by reallocating time from the coordination to the innovative network. If this is difficult, there are two ways to overcome the common weak knowledge about markets and customers in (rural) municipalities:

(1) to acquire social and human capital from external sources, for example by hiring external consultants, or

(2) to reallocate more time to the network activities at the expense of the remaining time allotted to running the business or reduced leisure.

The second option clearly has its disadvantages, both related to family and own well-being, and because restructuring a business to be more demand oriented is by itself time consuming.

5 Concluding remarks

We firmly believe that creating value added is a corner stone of any successful rural development strategy. This implies being able know who are the relevant consumer segments and their preferences. Understanding the demand side is imperative to being able to redirect the supply side so that what is produced actually can be sold, preferably at as high prices as possible. It is our impression (not having worked much in rural development ourselves) that the demand side has been given too little attention in rural development, both in terms of (public) rural development strategies, and in the rural development literature.

A stronger demand focus requires going outside the local municipality. Increased emphasis therefore needs to be placed on information processing and innovation. Networks play an important role in terms of lowering the costs of these activities. Such networks are usually large

differ with weak ties and structures (Table 1). These attributes make *explorative and innovation networks* substantially from *coordination networks*, that are characterized by strong ties and mutual commitments.

The allocative challenges are substantial for firms producing multiple products. These challenges grow manifold at the municipality level because of the increased dimensions of the production possibility set and because of externalities (spillovers) between enterprises. C*oordination networks* are needed to help solve these allocative issues at the municipality level. However, care must be taken so that these networks, that are closed and often inward looking, do not prevent the highly needed work to be done on mapping and understanding the demand side.

As mentioned in our introduction there has been little done on matching the demand and supply side related to rural and regional development. This is an area where more research is needed, and where the benefits to practical rural and regional development are likely to be large. We have also seen that there is a potential dichotomy between *coordination networks* and *explorative and innovation networks*. Because the coordination networks require a minimum commitment of time, it is difficult to reduce the time allotted to these networks. Making coordination networks more outward looking is one way to resolve the time conflict between the two network types. A key question is then how to make the coordination networks more outward looking while maintaining their allocative role in municipalities.

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ROLE OF INNOVATIONS AND KNOWLEDGE - INFRASTRUCTURE AND INSTITUTIONS

Andras Nabradi[1]

Abstract

There is a well known saying: Research converts money into knowledge, innovation converts knowledge into money.

The knowledge-based economy has four pillars: innovation, education, the economic and institutional regime, and information infrastructure. Transformation towards a knowledge-based economy will necessarily shift the proportion and growth of national income derived from knowledge-based industries, the percentage of the workforce employed in knowledge-based jobs and the ratio of firms using technology to innovate. Progress towards a knowledge-based economy will be driven by four elements: human capital development, knowledge generation and exploitation (R&D), knowledge infrastructure. Increased investment in these four areas will certainly have an impact. National experience, however, suggests that an incremental approach will not work. Nations that have achieved accelerated growth in outputs and capabilities have acted decisively, targeting investments in areas of strategic opportunity. The organizational and infrastructural improvement of research requires supranational cooperation and the promotion of the free movement of knowledge. Therefore, the EU decision on the establishment of the European Institute of Innovation and Technology (EIT), which ensures that the GDP proportion for research and development (R&D) shall achieve 3% stipulated by member states in the long run, is particularly welcome.

Key words: Innovation, knowledge, infrastructure, institutions

The concept of innovation has been interpreted in several ways. Its generally accepted definition by the World Bank is the following: the use of new ideas, new technologies or new ways of doing things in a place or by people where they have not been used before.

A related saying from the last century states that research converts money into knowledge - i.e. a body of knowledge, and innovation converts knowledge into money again. Figure 1 presents the structure of traditional innovation models.

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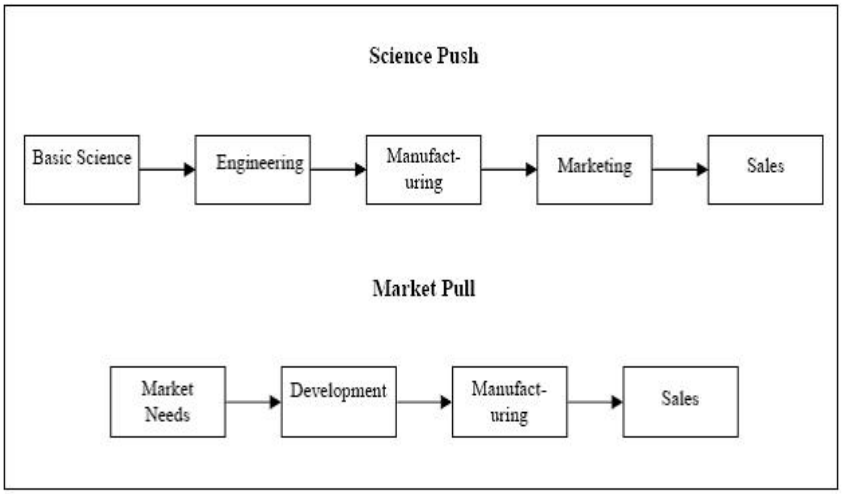


Figure 1 - Traditional models of innovation

The first step of knowledge-generated innovation is basic research, which is manifested, through applied research activities and engineering design, in concrete products or services. Marketing tools can support the distribution of these concrete products or services for the general public, thus new products and services are passed on to the end user.

The traditional innovation model has a marketing-induced variant as well. In this case, improvement is generated by market demands and new products reach consumers after the production process.

In the 90s, the above mentioned characteristic separation of innovation models was replaced by the so-called coupling model of innovation which came into the limelight. The concept of this model is that research from beneath and market demand from above exerts a simultaneous effect on the realization of new products and services. This is illustrated by Figure 2.

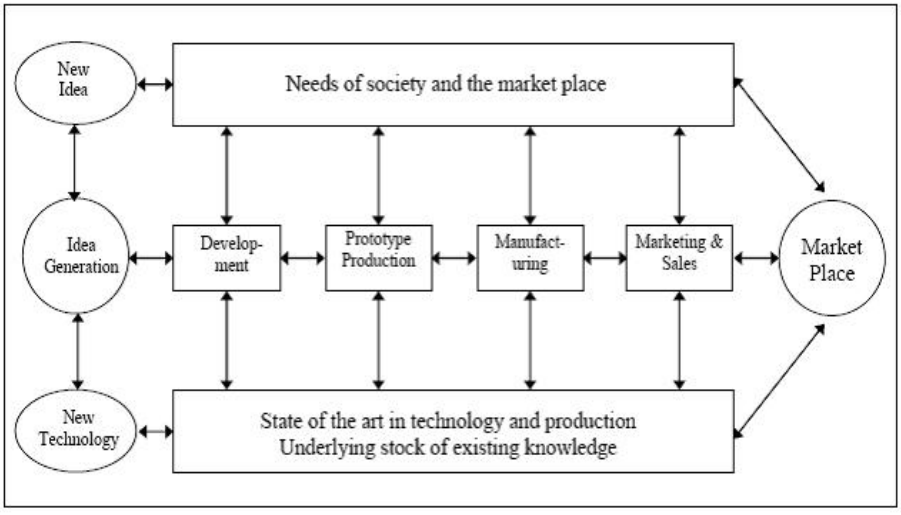
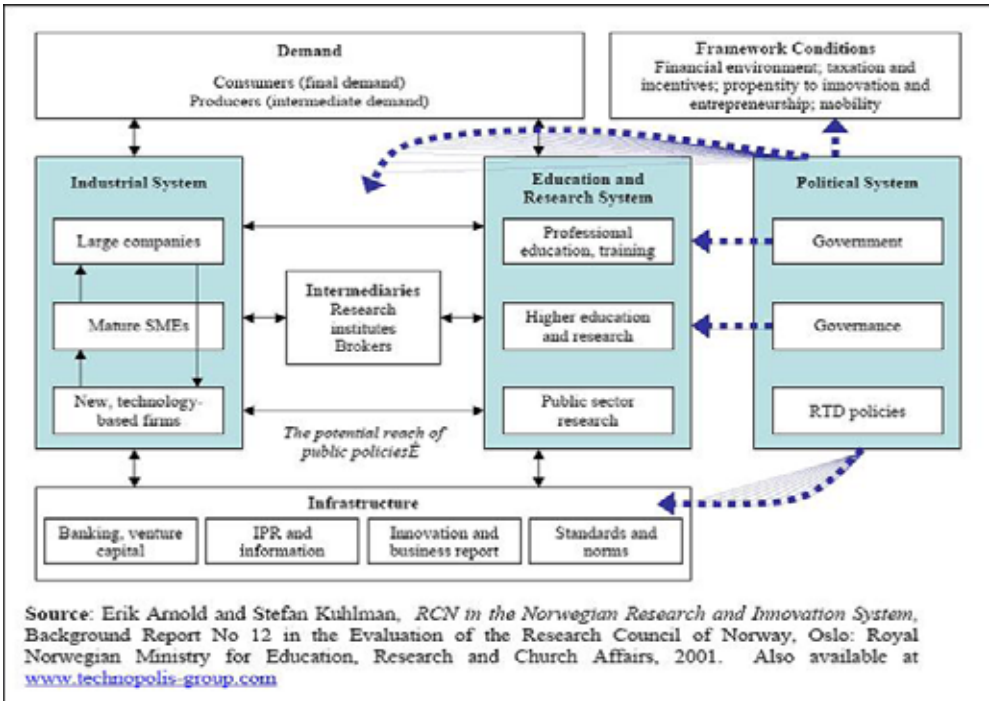


Figure 2 - Coupling model of innovation

The national model has been introduced by the innovation theories of the XXI century, as it is illustrated on Figure 3. This model suggests that not only research and markets generate demand for new products and services, but also the actors of national economy receive increasingly significant roles. It can be fundamentally stated that innovation is demand-oriented, by this is meant demands generated by buyers and producers. However, demand and conditions for innovation provided by the country also play significant roles. Preferential taxation, support, the promotion of entrepreneurship and mobility are priorities. (Figure 3)



Source: Erik Arnold and Stefan Kuhlman, *RCN in the Norwegian Research and Innovation System*, Background Report No 12 in the Evaluation of the Research Council of Norway, Oslo: Royal Norwegian Ministry for Education, Research and Church Affairs, 2001. Also available at www.technopolis-group.com

Figure 3 - A National Innovation System model

Political regimes can indirectly promote innovation through their own infrastructure, and thus financial institutions, international investors, highly sophisticated and controlled information flow, e.g. the publication of open invitations to tenders, patents, innovations and their compliance with national and international standards can play key roles.

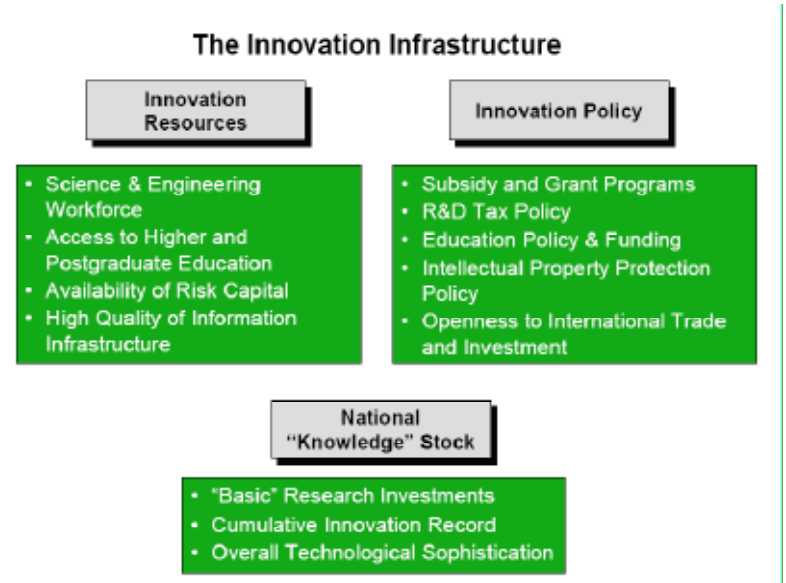
Politics can promote innovation not only through the instruments of its infrastructure, but directly or indirectly on governmental level. Its own research network, education system, especially in higher education induce the generation of demands for new products on one hand; on the other hand, they gear the assessment of market demands.

Practically, institutions of higher education and research represent an intermediate stage for industry and agriculture implementing innovation activities, for existing SMEs and large enterprises.

As a new element in our century, plenty of new companies are set up in order to exploit the research findings of innovation. These are called start-up or spin-off enterprises in daily practice.

While innovation and knowledge can provide joint support merely for the creation of patents

and innovations, infrastructure and organization forms can incite and support actual realization, implementation. Figure 4 shows the key elements of innovation infrastructure. The resources of innovation are based on fundamental and applied research resources, higher education and continuing training, primarily on invested capital and on the essentially significant structure of information worldwide.



Соурце: Сцотт Стерн 2005

Figure 4 - The Innovation Infrastructure

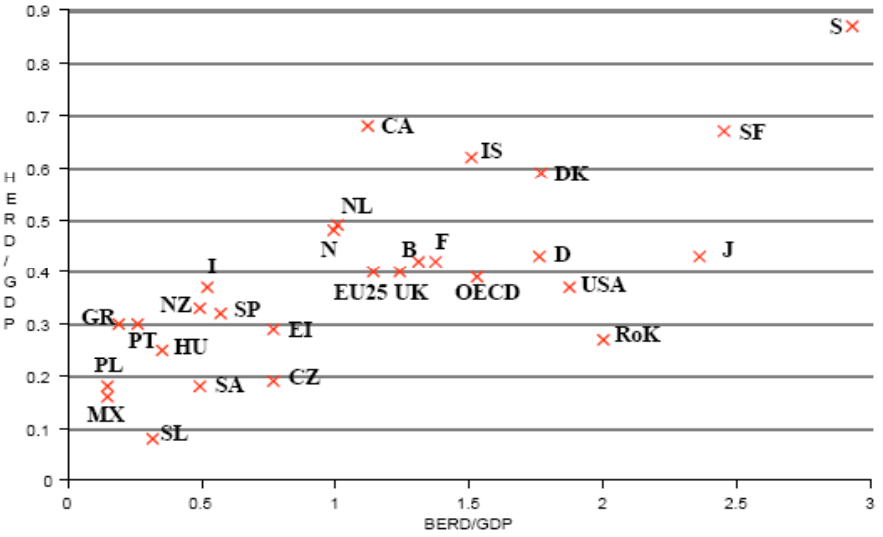
Resources can be supported or inhibited by the innovation policy of current governments. These resources also include positive elements such as scholarship, research support, beneficial tax policy in relation to research development, state support for education, protection of patients and innovations stipulated by laws and also an open attitude by governments towards international "innovation trade" and investment. Innovation resources and innovation policy develop an international knowledge base jointly and it is measurable in basic research findings, cumulative innovation reports and the technological development level of a given nation.

Therefore, a knowledge based economy has four main pillars: 1. innovation, 2. education, 3. economic and organizational regime, 4. information infrastructure. Today innovation has accelerated inconceivably. New products and services, based on previous investments, have improved the knowledge base, especially in the area of chemistry, biology, space and nuclear research by an unprecedented, fast and extensive information and technological explosion. Naturally, various countries will improve and introduce innovation to different degrees.

In Hungary, innovation is based on 3 key pillars. Besides innovative enterprises, universities and research institutions play fundamental roles in this area. Our findings indicate that in EU countries and therefore in Hungary the process of innovation is to be concentrated in some larger regional centres. These knowledge centres shall also be competitive on the global market. In Hungary, besides 5-6 highlighted research universities which have already proved their competitiveness by international standards, the existence of 2-3 institutions per region for vocational and tertiary training is appropriate to present and disseminate the application of innovations. The relation of innovation and higher education is demonstrated in a survey by OECD, MSTI in 2006. Figure 5 shows the relation between

Business Expenditure on R&D (BERD) as a proportion of GDP and Higher Education Expenditure on R&D (HERD) as a proportion of GDP.

Relation between Business Expenditure on R&D (BERD) as a proportion of GDP and Higher Education Expenditure on R&D (HERD) as a proportion of GDP.



Соурце: ОЕЦД, МСТИ2006

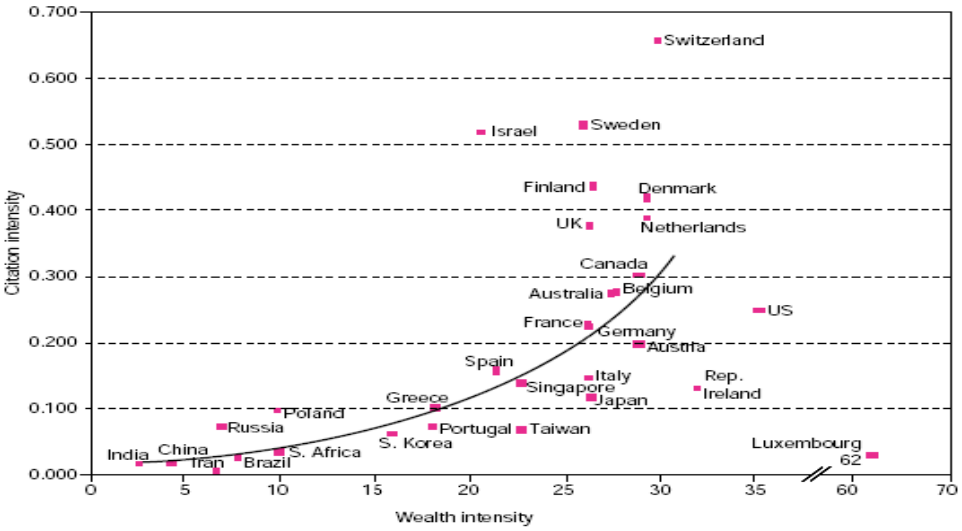
Figure 5 - HERD/GDP vs. BERD/GDP

Figure 5 clearly presents that developing countries, together with some ex-COMECON nations are on the bottom left part, also including a rich country such as Italy.

In the middle general part we can see EU and OECD countries, while countries of high level R&D are in the right upper section. Generally, a higher amount of money is coupled with higher level R&D generated by industries.

Figure 6 demonstrates the correlation between the economic wealth of nations and their "citation intensity". The graph shows the ratio of citations per unit (person) versus per capita GDP for the 31 nations. Wealth intensity is given in thousands of US dollars at 1995 purchasing-power parity.

The correlation is similar to data on Figure 5 Also, northern states, such as Finland, Sweden, Denmark and the Netherlands are highlighted in citation intensity while developing countries are placed in the bottom left third of the graph.



Sources: Thomson ISI, OECD and the World Bank

Figure 6 - Link between citation and wealth intensities

What does this correlation suggest? Innovation and knowledge base are successful if the related organization and infrastructure are available and countries support fundamental research and the dissemination of research findings with extensive resources in national or international cooperation.

Solution on EU level

The regulation of the European Parliament and the European Council states the significance of generating a new, community level initiative to complement national policies and to promote the integration of higher education, research and innovation in the EU.

This new institution is the European Institute of Innovation and Technology; **EIT.** The organization aims to strengthen the innovation potentials of members states and the community and thus to contribute to sustainable European economic growth and competitiveness. All this is implemented by promoting and integrating high-quality higher education, research and innovation. Under this regulation, the task of the European Institute of Innovation and Technology is to cope with long-term challenges emerging in the EU, with especial regard to trans - and /or interdisciplinary areas. It also seeks to promote periodical dialogues with civil society. Furthermore, its key task is to place higher education, research and innovation activities in business context and to promote their application in industrial areas, to establish and to support starting enterprises and utilizing spin-off enterprises.

The European Institute of Innovation and Technology (EIT) prepares a 7-year innovation plan by 30 June 2011 at the latest and then one every 7 years and submits them to the Committee. The innovation plan identifies long term priority areas for the EIT and includes an evaluation on the social-economic impacts and potentials related to added value production. The establishment of the organization has been a significant milestone in the fifth-freedom rights, namely in the implementation of the free movement of knowledge. Its operation contributes to the boost of EU research and development, rectifies deficiencies of private financing and approximates the GDP proportion of 3% stipulated by member states for R&D.

EIT (European Institute of Innovation and Technology) is a worldwide, significant milestone in the dissemination of knowledge-based innovation among nations and is the infrastructure for the dissemination of innovation results.

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SYSTEM OF EDUCATION, SCIENTIFIC-RESEARCH AND CONSULTING WORK IN AGRICULTURE OF SERBIA[1]

Drago Cvijanović[2]

Introduction

There is insignificant number of producers (cooperatives, enterprises, individual farmers) in Serbia, which have encircled production system and necessary machinery for processing and do business marketing and financially successful, which also introduced standards in production, succeeded in exporting on EU market, registered their products' mark of origin, internet domain etc. For creation of such, competitive and modern agricultural producer, there is necessary bigger financial support of state (before all, the Ministry of Agriculture, Forestry and Water Management of RS, Provincial Department for Agriculture, Forestry and Water Management), but also expert and consultative support „created" through strong partnership between public and private sector, i.e. tough and constructive cooperation of state and farmers sector, like as institutions of education, science, research and consultative work. In the paper was given review of number and territorial dispersion of educational institutions, current scientific-research work and consultative functions in agriculture in Serbia, than was pointed out main problems in their functioning and previous work and also provided concrete suggestions on overcoming existing limitations and modernizing / reorganizing of those institutions, in a way to be more useful for farmers.

1. Number and territorial dispersion of educational, scientific-research work and consulting function

The most shining star of Serbian economy and agriculture is science. In second half of past century, the science development, primarily scientific-research work in the field of social and technical-technological sciences (development of bio-technical sciences, agro-techniques, zoo-techniques) and surely in the field of agro-economic science, has contributed to modernization of agriculture and significant results in:

- Increase of production, size and quality of agricultural production, as well as
- Change of its production structure and economic/biological value (development of selection and hybridization in plant and livestock production).

Application of new knowledge, modern methods of production and technology in primary agriculture keeps going on nowadays, even more intensive (along with constant adjustment to changed climatic, i.e. agro-ecological conditions, energetic limits and along with constant respect of environment protection) and it reflects in: 1) development and implementation of qualitative (non-virus) highly productive seedlings of new fruits and grape sorts; 2) seeds of crop and vegetable cultures; 3) selection, registering and breeding of qualitative registered heads of cattle breeding.

In this point was shortly given review of number and territorial proportion: 1) secondary schools,

1 Paper represents a part of the research on the project *"Multifunctional agriculture and rural development in function of accessing the Republic of Serbia into European Union – 149007",* Ministry of Science and Technological Development of RS

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2) faculties, 3) scientific and research-developmental institutes, 4) laboratories and 5) expert agricultural offices, significant for agricultural development of Serbia. Regarding that basic carriers of new agro-technologies implementation in practice are scientific-research institutions and professional consultative office, more detailed analysis was dedicated exactly to them.

1.1. Educational system in Serbian agriculture, with special accent on development of agro-economic science

Educational system of Serbia within agriculture includes 25 secondary agricultural schools, whose establisher was the state.[3] Expert education in agriculture can be got also in some other secondary schools of technical, chemical or general type. As for faculties, according to data in the Ministry of Science and Technological Development, out of 118 accredited higher education institutions in the Republic of Serbia, 4 faculties of agriculture stand out (3 with excellent international reputation: Belgrade, Novi Sad, Čačak) and faculties of bio-farming, veterinary medicine and forestry[4]:

- Faculty of Agriculture – Belgrade,
- Faculty of Agriculture – Novi Sad,
- Faculty of Agriculture – Zubin Potok,
- Agronomic Faculty - Čačak,
- Faculty for bio-farming in Sombor – within „Megatrend" University – Belgrade
- Faculty of Veterinary Medicine in Belgrade,
- Faculty of Forestry – Belgrade.

Besides these formal educational systems, increasingly are pronounced the effects of other institutions: research-developmental institutes, the activities of the MAFWM of RS, which organizes series of educational workshops, seminars, lectures, along with support of non-governmental institutions, educational institutions and similar.

Agro economic branch and the science in Serbia have been especially increased during second half of 20th Century and in the beginning of 21st Century, when had been established major of nowadays agro-economic cathedras, departments and institutes. The analysis of condition, according to research of Prof. Sevarlic and Danilo Tomic, PhD[5], influences on satisfying territorial and institutional dispersion of agro-economic branch and science in Serbia, which is today present on:

- Faculty of Agriculture in Belgrade (within endures the Institute for Agro-economy),
- Faculty of Agriculture in Novi Sad (within endures the Department for Agricultural Economics and Sociology of the Village),
- Faculty of Economy in Subotica (four years lasting program of studies under title Management in Agri-business, which teachers and associates were registered since 2005 in special organizational unit – Department for Agrarian Economy and Business),
- On every economic faculties in Serbia (Belgrade, Niš, Kragujevac, Priština), agro-economic subjects are basic parts of curriculum of various economic profiles,

3 Ministry of Education RS, Registry of Institutions http://www.mp.gov.rs/ustanove/skole.php

4 Registry of accredited highly educational institutions http://www.nauka.gov.rs/cir/images/stories/akreditacija/akreditovani_fakulteti_cir_16.pdf.

5 Ševarlić, Tomić (2008):"Development, condition and perspectives of agroeconomic profession and science in Serbia" in proceedings „Agroeconomic science and profession in transition of education and agro-economy", Faculty of Agriculture in Belgrade, 2008, pages 39-41.

- Agro-economic subjects teach also in the first (and the only one, for time being) private agronomic faculty in Serbia – Faculty for Biofarming (2000) in Sombor,
- Agro-economic disciplines exist also in all secondary and high agricultural and food-technological schools,
- Beside highly educational and independent scientific-research institutions (Institute for Agricultural Economics, Belgrade; Institute for Scientific Appliance in Agriculture, Belgrade), the scientific-research centers within big agribusiness companies were contributed to development of agro economic research in Serbia, among which especially emanated PKB Agroekonomik in Padinska Skela.

1.2. Research-developmental institutes and laboratories in agriculture of Serbia

Great contribution to development of agro-economic science in Serbia gave for shore the **Institute of Agricultural Economics, Belgrade**, and furthermore, special accent will be put on it[6].

The Institute of Agricultural Economics (http://www.iep.bg.ac.rs)[7] was established by Decree of FNRY Government, in August 1949 and in 2009 it celebrates 60 years of existence. During its existence, as one of the oldest and the most distinguished scientific-research organizations in the sector of agriculture in the country, has been following continuously agrarian economic problems, analyzing them and giving suggestions for successful development of this important sector of national economy. In the beginning, major part of institute's activities related on activities realized for needs of that time Council for agriculture, and than set up cooperation with cooperatives and combines and started intensive terrain and scientific-research work. During its work, IAE – Belgrade has realized numerous projects in the field of research on macro and micro economic level.

In this period, basic activity of the Institute is: macro-economic and micro-economic research in agrarian field, creation of local economic development strategies, consulting, education, statistical and information support and publishing. Besides, the Institute participates continuously in realization of long term projects (Ministry of Science and Technological Development and Ministry of Agriculture, Forestry and Water Management of the Republic of Serbia). In its work, the Institute pays significant attention to young researcher's development, impelling improvement of young associates. At the moment, the Institute employs 29 men, i.e. seven Ph.D's, nine masters of study, eight research assistants and five employees as support staff.

Special accent in IAE's work, in last few years, has been given to:

- Numerous studies, i.e. strategies of local economic development and strategies of agriculture development, which IAE had worked in cooperation with local communities (and still works), as in the Republic of Serbia, as well as in surrounding countries. Special importance in these numerous strategies has, for sure, „Agriculture development strategy of the city of Belgrade till 2015",
- Activities in EU projects. IAE has been a partner or member of research team for two EU projects, concerning international cooperation within trans-national programs for South-East Europe: Tech Food and EU.Water.

6 http://www.nauka.gov.rs/cir/images/stories/akreditacija/naucni_instituti-cir_a.pdf Institute was accredited as scientific institute within the Ministry for Science and Technological Development, by Decree No. 110-00-34/44, on 26.04.2007.

7 Ivanović P. Srboljub and associates (Editorial Board) (1999.): 50 years of the Institute of Agricultural Economics (1949-1999) Belgrade.

- Projects of quality standards introduction, creation of concrete investment project reports and technical documentation for new investments, market analysis of some food-agricultural products etc.
- The Institute organizes and participates in numerous domestic and international scientific meetings,
- IAE has also very exuberant publishing activity: numerous published monographs, thematic proceedings, the IAE are co-publisher of 3 journals, out of which we single out „Ekonomika poljoprivrede“and „Ekonomika“.

Other, equally significant research-developmental institutes in agriculture of Serbia: Additionally will be quoted research-developmental institutes which has been (and are) very important for development and modernization of domestic agriculture. All quoted institutes in table 1 were accredited by the Ministry of Science (Law on scientific-research activity was determined that the Ministry of Science registered scientific-research organizations, which fulfill conditions for realization of scientific-research activity of general interest in the Republic of Serbia). Major institutes are located in Belgrade and Novi Sad.

Table 1 - The list of registered (accredited) research-developmental institutes within the Ministry of Science and Technological Development of RS

Institute of Field and Vegetable Crops, Novi Sad (http://www.nsseme.com) The Institute deals with basic and applied research, directed to making new sorts and hybrids of crop, vegetable, as well as numerous forage crops, industrial, medicinal and aromatic herbs. Beside scientific part, the Institute develops also commercially, i.e. does business at the same time as scientific institute and seed company. The Institute had placed trademark „NS seme“, too. The interest for growing NS sorts and hybrids is increasing, especially in East Europe countries.
Maize Research Institute „Zemun polje“, Belgrade (http://www.mrizp.co.rs). This is leading institutions in the country in application of scientific-research work, which deals with creation, production and introduction of new high-yielding, quality maize hybrids and soybean cultivars for various agro-ecological conditions of growing, different needs and purposes.
Institute for Animal Husbandry, Zemun (http://www.istocar.bg.ac.rs). The Institute deals with fundamental, applied and developmental research, international scientific and technological cooperation, transfer of new technologies, experimental production and similar. The Institute disposes with: new technologies for meat production, modern technological solutions for farms and mini-farms, abattoirs, dairies, forage mixing machine, than with complete nutrition technology for specific species and categories of domestic animals etc.
Fruit Research Institute Čačak (http://institut-cacak.org/index.php) The Institute participates active in novelty implementation in fruit growing (world famous sorts of plum, which came out of this institute are: Čačanska rana, Čačanska lepotica and Čačanska rodna). The basic activity of the Institute is scientific-research work in the field of fruit growing – research and experimental development in bio-technique sciences, and additional activity realizes within Department for Making and Keeping Seedling Material of Fruits.

Institute for Vegetables and Crops, Smederevska Palanka (http://www.institut-palanka.co.rs)

Professional jobs in the Institute imply organization of production and quality control of vegetable seeds, its processing, packaging and placement. The Institute disposes of around 150 ha of arable land, with possibility of irrigation, greenhouses and cloches for vegetable production, laboratory, mechanization and similar. Taking into consideration personnel and material organization of institute's work, number of made vegetable sorts and their placement on the market, there can be said that the Institute for Vegetable and Crops today represents leading scientific and productive institution in this region. Here point out that „the science in the Institute has never been purpose to its self, and that, ahead of us, had always been clear, practical and applicable goal – a new sort".

Institute of Agricultural Economics (http://www.iep.bg.ac.rs)

This Institute was already spoken about.

Institute of Scientific Application in Agriculture, Belgrade (http://www.psss.rs)

The Institute is a carrier and realizer of several Ministry of Agriculture's programs, while the main accent has been put on consulting programs (Law on Professional Agricultural Office from 1991 authorized the Institute as co-ordinator of agricultural professional service). However, the Institute's activity is: research and development in bio-technical sciences, transfer of modern scientific-research achievements and applied research on farmers' properties, coordination and control of work, like as education of consultants in the Agricultural Professional Office in the Republic of Serbia.

Institute for Plant Protection and Environment, Belgrade

In its research programs and projects are present various fields, from plant protection, biology, chemistry, technology, phyto-pharmacy, toxicology, to environment protection, so this Institute is successfully fit for the most important tasks from the program of scientific and technological development of RS.

Institute of Pesticides and Environment Protection, Belgrade (http://www.pesting.org.rs)

The Institute is registered for research and experimental development in bio-technical sciences. It units research in the field of phyto-medicine, pesticides appliance and environment protection, and also provides services through examination of pesticides' biological efficiency, testing pesticides and fertilizers' characteristics and their remnants in grown plants, agricultural products and environment.

Source: Ministry of Science and Technological Development of the Republic of Serbia http://www.nauka.gov.rs/cir/images/stories/akreditacija/razvojni_instituti_cir_3.pdf.

Besides these research-developmental institutes at the Ministry of Science were registered also following significant institutes: Scientific Veterinary Institute „Novi Sad" in Novi Sad, Institute of Veterinary of Serbia in Belgrade, Institute of Land Belgrade; Institute of Forage Crops, Kruševac; Institute for the Study of medicinal plants, "Dr. Josif Pančić" Belgrade; Institute of Forestry in Belgrade; Institute of Lowland Forestry and Environment, Novi Sad; Institute of Hygiene and

Technology of Meat, Belgrade; Institute for Water Resources „Jaroslav Cherni“ in Belgrade.

Laboratories in Serbia: According to data of Accredited Body of Serbia [8], in the field of physically-chemical and biological research of production material in agriculture (animal food, seed, plant material, fertilizers, land, pesticides) were accredited massive number of organizations (institutes, independent laboratories and laboratories in offices for agriculture improvement at agricultural stations, agricultural professional offices etc.) in the field of physically-chemical research of food were accredited even 77 organizations.

1.3. Agricultural professional offices as the most efficient form of modern scientific / professional achievements transfer in primary production

Agricultural consulting in Serbia is still in early developmental stage. The consulting in Central Serbia was defined and financed by MAFWM of RS, and in AP Vojvodina – by Provincial Secretariat for Agriculture, Forestry and Water Management. The consultative work, defined by clause 2 of Decree on Conditions and Method of Incentives Use for Support in Conducting Business in Agriculture[9] encloses numerous jobs, first of all: tracking selected registered agricultural husbandries (education in the sphere of growing technology, standards and EU regulations), educational activity (giving references, professional advices, organization of lectures, seminars), introduction of new assortment and breed combine by performing demonstration experiment in plant and livestock production, control function (soil, seed, plant and livestock analysis) and similar.

Number of agricultural professional offices, consultants and selected husbandries: Those jobs in Central Serbia do 18 agricultural offices, which are registered at MAFWM of RS (the offices are located in Niš, Valjevo, Vranje, Kraljevo, Jagodina, Kosmaj, Kosovska Mitrovica, Kragujevac, Kruševac, Leskovac, Užice, Negotin, Novi Pazar, Čačak, Pirot, Smederevo, Stig, Šabac), where the Institute for Scientific Application in Belgrade is authorized for control business and coordination of these jobs . On AP Vojvodina area, the agricultural professional offices are under the authority of / financed by the Provincial Secretariat for Agriculture, Forestry and Water Management, while in the middle of 2009, the consulting was conducted through 13 agricultural offices[10]. On territory of Central Serbia, the consulting do 135 consultants, which „cover“ 4.050 selected husbandries in 2009 (experimental and distinguished husbandries, chosen by voluntary principle)[11]. In AP Vojvodina area were registered 80 consultants in 2009, which cover around 3.100 selected husbandries[12].

8 ATS (http://www.ats.rs/index.php) is non-profit independent organization for determination of organizations' competence for doing business – evaluation of adjustment, established by the Republic of Serbia.

9 Decree on conditions and method of incentives' use for support in conducting entrusted business in agriculture for 2009 („Official Gazette RS“ No. 20/09 and 45/09).

10 (1) „Agrozavod“, Subotica; (2) „Zavod za unapređenje poljoprivrede“, Bačka Topola; (3) „Poljoprivredna stanica“ Senta; (4) „Agroinstitut“, Sombor; (5) „Agrozavod“, Vrbas; (6) „Poljoprivredna stanica“, Novi Sad; (7) „Poljoprivredna stanica“, Ruma; (8) PI „Dr. Petar Drezgić“, S. Mitrovica; (9) „Poljoprivredna stanica“, Kikinda; (10) „Institut za poljoprivredu“, Zrenjanin; (11) „Agrozavod“, Vršac; (12) „Institut Tamiš“, Pančevo; (13) „Poljoprivredna stanica Kovin“, Kovin. The list of agricultural stations registered at Provincial Secretariat for Agriculture, Water Management and Forestry http://www.psp.vojvodina.gov.rs/index.php?t=0&pid=8

11 Decree on determination of long-term working program of agricultural office on improvement of agricultural production for period 2009-2013. This Decree anticipates that the number of agricultural husbandries will increase from 4.050 (in 2009) to 6.750 in 2013.

12 According to data of Provincial Secretariat for Agriculture, Water Management and Forestry in 2010, there is a plan to increase number of consultants to 100, and therefore proportionally increase of agricultural husbandries' number.

Total number of selected husbandries in the Republic of Serbia in 2009, which „cover" consultants amounts 7.150, or just 1,6% of totally registered husbandries in the republic (according to data of Administration for Vault, the Ministry of Finances of RS, in Serbia was registered 440.650 agricultural husbandries until 31.08.2009 This percentage is significantly less (0,9%) if takes into consideration the number of statistically listed agricultural husbandries (778.000 with extremely unfavorable property structure, Census 2002).

Property and financing the professional offices. Agricultural professional offices of the Republic of Serbia (in a form of institutes, stations and offices) have functioned in social (public) sector until 2009. Since than, they have transformed from social to state property, which have meant that the state (MAFWM of RS and Provincial Secretariat for Agriculture, Forestry and Water Management) had become their founder. The agricultural professional offices finance dominantly from the budget (the republic, i.e. the autonomous province) and partly from own sources, realized on the market.

2. Analysis of basic problems and systematic mistakes in the field of education, scientific-research work and consulting in Serbian agriculture

Our scientists had created numerous high-yielding sorts and hybrids of crop and fruit cultures, by selection had been created numerous high-productive species in livestock breeding etc. However, the potentials and possibilities of science our farmers use insufficiently, while the appliance of innovations and modern achievements is on low level. For example, Chile, as leading producer and exporter of vegetable and fruit in the world invest enormous assets, each year, in technology and scientific research. The package techniques, bio-chemical treatments in production and logistics keep researching and constantly improving, along with expert selection of appropriate sorts. In Serbia, these researches intermit, and just several practical examples point out to application of high achievement of science and production technologies. Good example is, for sure, the informatics orchard of „Delta Agrar" in Čelarevo and modern, computerized cloche within concern „Farmakom M.B." Šabac[13].

It is obvious that there is no tough functional connection, in Serbia, between respective scientific potentials on faculties and institutes, as emitters of specific services, on one level, and individual farmers, cooperatives, agricultural enterprises, as their users, on the other. This is determined by World Bank research in 2006. Using the package of Knowledge Economy Indicators – KEI[14], the World Bank Report ranks 30 countries of Central and East Europe and Middle Asia according to ***their capability to invest in innovations efficiently.*** Out of 25 countries which belong to category of post-communist countries, the best concerning total evaluation of knowledge economy are Estonia, Slovenia and Lithuania, and the worst are Bosnia and Herzegovina, Albania and Tajikistan. Serbia is on 17th position according to knowledge economy total rank (KEI), and observed in accordance to individual indicators of knowledge economy, Serbia got the worst mark for indicator of economic

13 The orchard stretches on 110ha and is covered with information system of frost protection, anti-hail network, waters by drop-by-drop system. The orchard has Global Gap and company „Delta agrar", as a part of „Delta holding"invested 5 million euros in it. Cloche within concern „FARMAKOM M.B.", Šabac stretches on 4,2 ha, heats by thermal waters, while production process is completely covered by computer.

14 Package „Knowledge Economy Indicators" (Knowledge Economy Indicators - KEI) encircles: 1) economic relieves and institutional regime (support to investments in information and communication technology, environment which courage entrepreneurship, which provides free knowledge flow, covers laws reign, protection of intellectual property, anti-corruption strife, 2) education, 3) efficient innovation system (network of research centers, universities, private enterprises), 4) information structure (from radio to internet). Source: Public Financial Support for Commercial Innovation, January 2006, World Bank, page 49

stimulations and relieves, and the best for education (that mark ranks Serbia on 23rd position among 30 analyzed countries)[15].

Table 2 - Comparison of ECA countries according to KEI and four pillars of National Innovative System

Countries in region	KEI	Rang KEI	EIR	Rang EIR	I	Rang I	O	Rang O	II	Rang II
Slovenia EU	7.88	3	7.01	5	7.91	3	8.58	2	8.00	4
Hungary EU	7.01	8	6.42	10	7.00	9	7.65	10	6.98	11
Czech Republic EU	7.00	9	6.01	13	6.92	10	7.10	15	7.96	5
Poland EU	6.86	12	6.36	11	6.15	14	8.32	4	6.60	14
Slovakia EU	6.70	13	5.96	14	6.70	12	6.65	18	7.47	7
Croatia	6.22	14	4.31	18	7.12	7	6.55	19	6.91	12
BulgariaEU	6.19	15	6.05	12	5.94	17	6.73	17	6.03	15
Romania EU	5.27	17	4.37	17	5.20	21	5.60	25	5.93	16
Serbia	**4.55**	**22**	**2.15**	**25**	**5.17**	**22**	**5.93**	**23**	**4.94**	**20**
BH	3.02	28	2.62	24	1.02	30	4.00	30	4.45	21
Albania	2.99	29	2.66	23	1.65	28	4.81	28	2.82	27

Legend: Category ECA (Europe and Central Asia) encloses following 30 countries: Albania, Armenia, Byelorussia, BH, Bulgaria, Croatia, Czech, Estonia, Finland, Georgia, Greece, Hungary, Israel, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Moldavia, Poland, Portugal, Romania, Russia, Serbia, Slovakia, Slovenia, Spain, Tajikistan, Turkey, Ukraine, Uzbekistan

KEI - Knowledge Economy Indicators, EIR – Economic stimulation and institutional regime, I – innovation, E – Education, II – Information infrastructure

Source: Financial Support for Commercial Innovation (Europe and Central Asia Knowledge Economy Study Part I); http://www.worldbank.org/eca/kestudy), January 2006, World Bank.

Reasons for insufficient implementation of existing knowledge in practice and lack of strong connection of scientific research on faculties and institutes with agricultural practice (enterprises, individual farmers, cooperatives) are numerous and some of them are quoted below.

I Problems in the field of education and agro-economic science: Educational system (from secondary school to college education) is drafted in a way that young personnel, after finished education, get very little of practical skills. At the same time, although the needs for expert personnel (especially agro-economists, agronomists) are significant, the possibilities to get a job are small, regarding that agricultural cooperatives for a long time have not solved property status, and number of successful agricultural enterprises, institutes and other organizations where they could get a job, was insufficient. In development of agro-economic science, as some of the leading problems, the author's Ševarlić and Tomić, see: several-decades-lasting absence of scientific papers of major domestic agro-economists in international journals, absence of any papers' review, and increasingly less proportion of micro-agro economic research etc.[16]

15 Ibidem, page 49 i 57. http://siteresources.worldbank.org/INTECA/Resources/KE_Study_Final.pdf

16 Ševarlić, Tomić (2008): „Development, condition and perspectives of agro-economic profession and science in Serbia"in proceedings „Agro-economic science and profession in transition of education and agro-economy", Faculty of Agriculture – University in Belgrade, 2008, pages 44-45.

II Problems in work of research-developmental institutes*: In research work, big problems are: 1) insufficient financial value of the research by the government (this problem has been partially lessen), 2) unsolved business offices for some institutes and insufficient investments of the state into business offices' supplying and objects' reconstruction, 3) insufficient applied research realized at the institutes. Exactly this third problem deserves special attention. Although is more and more criticism addressed to science in Serbia that it functions as activity with an end in itself (functioning only through projects financed by the authorized ministry), there should point out that the reasons do not ,,lie" in insufficient engagement of institutes' management or insufficient number of professional and inventive researchers, but in numerous ,,chronic" problems Serbian agriculture meets in last decades.*

Taking into consideration following precaution (suggestion, reference) of the World Bank, although constructive and absolutely correct, should be taken with reserve and clear limits for appliance in our country. The World Bank clearly warns the countries of Central and East Europe that they lag behind developed countries in the field of investments in development and research, and simultaneously send them to undertake the steps toward conditions improvement for increased investments in ***commercial innovations (so called, transforming research and development into market success****), which is crucial for achieving sustainable and long-term economic growth[17]. The experts of World Bank point out that, despite of numerous researchers and successful education, which have been inherited from communism period, will be hard for Central and East Europe countries to convert their potential advantages in commercially successful innovations unless* ***universities and research institutions will not cooperate closely with private sector, i.e. unless research system restructure concerning adjustment to economy needs[18].***

III Systematic problems in functioning of agricultural consultative offices*: Although the agricultural consultative office should deal with implementation of agrarian policy in practice and to represent direct connection between the state and farmers, ,,existing system of agricultural stations is not capable to provide qualitative service to producers, because of inadequate structure, lack of equipment and financial support of the state, as well as insufficient personnel capacity"[19].These problems of consultative office are still unsolved, and as the result is evident incompatibility in agricultural practice between number of experts in consultative offices (especially number of direct consultants) and total number of agricultural husbandries and arable land (see item 13). Besides, the problem also lies in fact that consultative office mostly provides advices about application of bio-zoo-technological knowledge in production (by performing demonstration experiments in plant and livestock production, by providing laboratory services etc.) to selected husbandries. The possibilities of ACO to provide advices on market trends of production and prices of agricultural products, measures and decrees of MAFWM of RS, to support farmers in creation of business plans, associations, introduction of standards and similar – are very limited and they do not reach major farmers.*

What is the ***significance of consulting role to husbandries****, and how it lacks confirm data of small rural household's survey in Serbia, which is under sponsorship of UNDP, conducted during*

17 Public Financial Support for Commercial Innovation (Europe and Central Asia Knowledge Economy Study Part I), Januar 2006, World Bank.

18 Average participation of research and development costs in GDP in analyzed countries of Europe and Central Asia (out of 30 countries, only several belong to developed EU countries) is 0,9%, which is far below target rate EU of 3% (these countries should realize until 2010). Two third of research and development costs in these countries, mostly post-communist, is covered from governmental sources. Totally opposite, in countries with high participation of research and development costs in GDP, like Japan, USA, Sweden, Finland, Ireland, Germany – participation of private (industrial) research is from 65% to 70%, while the government set aside only about 20-30% of assets for these research. Ibidem, page 3.

19 Development Strategy of Agriculture in Serbia, Official Gazette RS, No. 78/05, page 28.

December 2006. This research has shown that „the need for information and advices is high rated among all respondents", but acquaintance of that service among small rural households in Serbia had been discouraging, which had confirmed the data that only 8% of respondents had a contact with consultative office, more than 40% of households had non acquaintance that such service existed, 24% of respondents had a need for these services, but without any clue to get them[20].

3. Suggested solutions for new role of educational, scientific and consultative institutions in agriculture of Serbia

Due to increase of competitiveness and forming of more efficient agricultural sector, it is necessary to work on further improvement and construction of institutions in the field of agriculture, i.e. it is necessary to accede, as soon as possible, to reorganization of educational system, scientific and research-developmental institutes, as well as consultative offices.

Solutions in the field of education and agro economic sciences: In the field of education is necessary to finish reform according to Bologna Declaration, in order to form unique European educational system. Aiming to achieve future successful development of agro economic science in Serbia, the authors Ševarlić and Tomić[21] specifically point out: 1) a need for publishing the scientific papers of our agro economists in prestige international scientific journals, 2) need to cherish a critical relations of researchers toward actual agro economic practice, than collegial dialogue, especially is necessary to reaffirm reviews institute, 3) the need to increased engagement of agrarian economists in project realization for increase of agribusiness firms' competitiveness and their promotion on international market.

Solutions in the field of research –developmental institutes: In future period is important for scientific, professional and educational institutions to connect tightly and mutually (as in the country, as well as in the region), as well as intensifying their cooperation with governmental sector, especially with sector of economy and needs of entrepreneurs and investors. Therefore is necessary ***higher proportion of micro-economic research in agriculture (so called, applied research).*** These researches perform according to determined needs of farmers, processors and other groups or individuals, aiming to gain and apply new knowledge in process of agricultural production, turnover and placement of agricultural products.

The World Bank report in 2006 on governmental support to commercial innovations[22], leads Central and East Europe countries, as well as Middle Asian countries to stop spending their, already limited governmental resources, on archaic innovation systems and start to impel private firms to involve in that process, as it is in the West. Previously mentioned doesn't mean that the state should completely stop to finance the researches, but, when they set aside the assets for those purposes, the accent should be on private enterprises' research. The role of state is also indisputable and inevitable in conducting structural reforms in order investments and innovation to bring

20 Bogdanov Natalija (2007): "Small rural households in Serbia and rural non-agricultural economy", UNDP, Belgrade, pages 143-144. This project was carried out in cooperation with MAFWM RS and Program of UN for development (UNDP), during 2006/2007. Targeting group of the project (terrain research) were small rural households with inactive developmental potential, which can be mobilized by making adequate conditions for diversification of activities and income.

21 Ševarlić, Tomić (2008): „Development, condition and perspectives of agro-economic profession and science in Serbia" in proceedings „Agro-economic science and profession in transition of education and agro-economy", Faculty of Agriculture – University in Belgrade, 2008, pages 49-50.

22 Public Financial Support for Commercial Innovation (Europe and Central Asia Knowledge Economy Study Part I), Januar 2006, World Bank.

profit. If the country has a lack of institutional frame and innovative/information infrastructure, or lack of appropriate economic policies and incentives set, insufficient connection of scientific institutions with private sector, inadequate educational system etc., funds used for support to research and development, as well as innovations can be misspent.

Resolutions in the field of consultative function: There are necessary key reforms to agricultural consulting of RS, in order to provide for consulting to encircle as bigger as possible number of producers-farmers. Consolidation of consulting is expected through adoption of Law on Practicing Consulting and Professional Activities in the Field of Agriculture[23], through defining rules of agricultural offices work, through Rules on Conditions and Practicing the Consulting Services, agricultural producers etc. In future period is particularly expected to be defined which are consulting and which are professional activities, number of consultants, their licence (mentors and consultants) and education, who can be consultant, which are constant income resources of consultants and similar.

Consulting will have its full role when it could be in possibility to offer to major users, not only scientific results of bio-technological, zoo-technological and agro-technological sciences, but also agro-economic sciences, or when it will be able to provide following advises:

- providing market information connected to realized production level and price of agricultural products in the country and surroundings,
- informing farmers on agrarian policy measures,
- providing marketing services, first of all support in placement of products,
- providing financial and legal services, especially supporting producers in making business plans and requirements for banking credits, education on possibility to finance by mortgage and other credits etc.,
- education on advantages and opportunities of interest joining in associations, cooperatives, clusters, etc.,
- Informing the farmers on sustainable agriculture and environment protection.

Solutions in the field of laboratory: Serbia still has not National Laboratory for Food Control, and neither exist a firm or laboratory which deals with biological means of plant protection, which is important for organic production. In future period will be necessary to rationalize the system of massive number of laboratories, by forming less number of national referential laboratories and regional laboratories.

Conclusion

Constant economic growth owes more and more to technical-technological innovations and, so called, knowledge economy. Transition of economy (and agriculture) of Serbia concerning more significant application of knowledge, innovations and new technologies – implies numerous reforms in sector of education, science, research-developmental institutions and consulting. In all these reforms, the role of state is crucial, but not only as a financier. The state has to provide primarily **institutional and economic frame** for development of education and science (creating the environment which encourages entrepreneurship, provides free circulation of knowledge, information, which provides laws rules, protection of intellectual property, supporting investments

23 Bill on performing consulting and expert businesses in the field of agriculture primarily anticipates that agricultural consultant can do consulting according to licence and after being registered in the Registry of Agricultural Consultants. http://www.minpolj.sr.gov.yu/index.php?option=com_content&task=view&id=1207&Itemid=72

in information and communicational technology). The role of state is to adjust the **educational system** to needs of economy, too (research centers, universities and private enterprises network) and **information infrastructure**.

Creation of competitive and innovative sector of agriculture cannot be imagined without strong connection of public and private sector, without strong connection of the state, education, science, consultants and farmers. Full application of bio-technical, zoo-technical, agro-technical and agro-economical knowledge in whole reproduction chain (starting from quality control and cultivation, protection and nutrition of plants, to final sale and consumption) is a path to creation of qualitative and certified agricultural products, to higher export and increase of export incomes.

In accordance to Bologna Declaration, there is expected ending of education reforms in future period, the reform of consultative agricultural office, more tough connection of all science, profession and education institutions mutually (as in the country, as well as in the region), and also intensification of their cooperation with governmental sector, especially with economy sector and needs of entrepreneurs and investors.

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Parallel Workshop Session A

TERRITORIAL COMPETITIVENESS: FACTORS OF DEVELOPMENT AND THE ROLE OF AGRICULTURE

TARGETING LAGGING TERRITORIES WITH EU RURAL SUPPORT POLICY: CASE STUDY IN LATVIA

Eudokia Balamou[1], Daina Saktina[2], William Meyers H.[3]

Abstract

The paper uses a bi-regional CGE model to assess the potential impacts of an alternative rural development policy design, which is more targeted to public sector investments on the economic activity of a lagging region in Latvia. The results show the distribution of effects between the rural and urban areas within the region as well as differences in the impacts between the three policy scenarios that are explored. All scenarios generate positive effects in the economy. However, the "Investment in Public Sector with enhanced envelope" scenario is the one that leads to the largest impacts in the economy. The "Investment in Public Sector with no envelope" is the second best scenario and has better effects compared to the Scenario that has enhanced financial envelope but with no reallocation. Overall, the results suggest that it's not only enhanced funding that will improve economic performance in an economy but also the targeting of these funds to the more productive sectors of the economy that have the highest linkages within the economy and consequently the potential to create strong direct and indirect effects spread to the regional economy.

Key words: lagging rural areas, bi-regional CGE model, rural development policy, CAP

Introduction

The practice of competitive programming of EU resources tends to put lagging regions such as Latgale, the poorest in Latvia, at a disadvantage for financial flows outside of income payments through the CAP. Future reforms in CAP are likely to result in more funding available for rural development rather than farm support. The question is whether the transfer of resources from individuals to more broad-based development will have the desired multiplier effect. In other words, to find the most effective approach that will have the best economic performance in terms of macroeconomic indicators and sectoral effects for Latgale region.

Rural development in Latvia has been stimulated by the Rural Development Program (RDP) 2004-2006 that was financially supported by the government and EU pre-accession funds. A comprehensive study in 2005 concluded that the RDP implementation did not reduce the polarization between the rich central and western regions and the poor eastern rural areas. Also, a study made in 2006 provided practical recommendations on further development of support policy to reach the goals defined for the national development policy in Latvia. In particular, it recommended on how to allocate rural development funds to regions lagging behind.

Within this context, the paper takes the previous work further by analyzing likely impacts of

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two policy design and implementation changes: 1) applying the territorial financial envelope concept to the Rural Development Programme (RDP) 2007-2013 and 2) changing the support priorities. In particular, to evaluate the impacts of different policy scenarios for the Latvian 2007-2013 RDP on urban and rural multi-sectoral economies and households in Latgale region. These impacts are evaluated with the use of a bi-regional CGE model. Although the model is essentially neoclassical, it is sufficiently flexible to accommodate a fairly wide range of views on how regional economies adjust to the specified policy scenarios. The CGE model built has been further developed to include several specific elements such as the differentiation of rural and urban production sectors, factors and households plus several specific characteristics of the regional economy under analysis. Thus, results are rich in detail by separating households into 3 urban categories and 3 rural categories in addition to farm households. Also factors of production (labour and capital) are spatially distinguished to rural and urban and also labour is separated to skilled and unskilled labor.

The rest of the paper is structured as follows. Section 2 describes the nature and specific characteristics of the CGE modeling framework used in the analysis and its application in this case. Section 3 provides background information on the design of the three policy scenarios that are explored in this study, while Section 4 presents the results from the analysis. The paper ends with relevant conclusions and recommendations.

The Modeling Framework

The CGE model used in the analysis is based upon a standard framework as given by IFPRI (Lofgren *et al*., 2002) but was modified so as to capture the key rural-urban interdependencies at the regional level and also the regional characteristics of the region under study.

Production Behavior

Production is based around activities, where each activity is based in either the rural or urban part of the region and produces one or more commodities in fixed proportions per unit of activity those allowing for a multiple output structure.
Each producer is assumed to maximize profits, which are defined as the difference between revenue earned and the cost of factors and intermediate inputs. Profits are maximized subject to a production technology. At the top level, the technology is specified by a constant elasticity of substitution (CES) function of the quantities of value-added and aggregate intermediate input. The CES function suggests that available techniques permit the aggregate mix between value-added and intermediate inputs to vary. Value added is itself a CES function of primary factors whereas the aggregate intermediate input is a Leontief function of disaggregated intermediate inputs. At the bottom level each activity uses composite commodities as intermediate inputs, where intermediate demand is determined using fixed Input-Output (I-O) coefficients. Value added is a CES function defined over factors of production, which are spatially specific.

As part of its profit-maximizing decision, each activity uses a set of factors up to the point where the marginal revenue product of each factor is equal to its wage. Factor wages may differ across activities, not only when the market is segmented but also for mobile factors.

Factor payments accrue to the owners of the factors (households) as reflected in the base SAM. The CGE model requires certain assumptions in relation to the way in which supply and demand in factor markets come about. In relation to labour markets, these range from assuming the wage rate to be perfectly flexible (Neoclassical adjustment), to allowing for unemployment (Keynesian adjustment) or segmented factor markets. Analogous assumptions exist for the capital factor in the model.

Commodity Markets

All commodities (either produced within the region or imported), with the exception of home-consumed output, enter markets; and activity-specific commodity prices serve to clear the implicit market for each disaggregated commodity. At the first stage, regional (domestic) output is produced from the aggregation of output of different activities within the region of a given commodity. At the next stage, the aggregated regional output is split into the quantity of regional output sold domestically and of that exported via a constant elasticity of transformation (CET) function.

As is widely practiced in the CGE literature, a so-called "Armington" function is used to prevent "over-specialization" and to better reflect the empirical realities of most regions. This approach assumes imperfect substitutability between imports, exports and commodities produced within the region. Regional market demands are thus assumed to be for a composite commodity made up of imports and regional output, as captured by a CES aggregation function. Also, the model assumes that export and import demands are infinitely elastic at given world prices. Flexible prices are also assumed to equilibrate demands and supplies of domestically marketed domestic output (i.e., output within in the region).

Institutions

Institutions in the CGE model are represented by households, government and the rest of the world account. Households (disaggregated according to the SAM table) receive income from the factors of production (in proportions fixed at the base year level), and transfers from other households, the government and the Rest of the World. This income is spent to pay direct income taxes, to consume, save and make transfers to other institutions. Direct taxes and transfers to other domestic institutions are defined as fixed shares of household income, whereas the savings share is flexible. The treatment of direct income tax and savings shares is related to the choice of closure rule for the government and savings-investment balances. Household consumption covers marketed commodities, purchased at market prices that include commodity taxes and transaction costs, and home commodities, which are valued at activity-specific producer prices. Household consumption is allocated to market and home commodities based on a linear expenditure system (LES) demand function that is derived from the maximization of a Stone-Geary utility function (Dervis *et al*. 1982, Blonigen *et al*., 1997).

The second institution is the combined government account, representing both local and central government. Government collects taxes (all taxes are at fixed ad valorem rates) and receives transfers from other institutions. The government uses this income to purchase commodities for its consumption and to make transfers to other institutions (e.g. Households). Its consumption is fixed in real terms whereas government transfers to domestic institutions are CPI-indexed. Government savings (the difference between government income and spending) is a flexible residual.

The final institution is the Rest of the World account. Transfer payments between the rest of the world and domestic (regional) institutions and factors are all fixed in foreign currency. Foreign savings is the difference between foreign currency spending and receipts.

Policy Scenarios

The scenarios that have been selected for this analysis are of direct relevance to area payment schemes (Pillar 1) and the Rural Development Programme (RDP) of 2007-2013 (Pillar 2) for the rural region of Latgale:

1. Baseline: **No Latgale Financial Envelope:** total funding available is the share of funding that actually occurred in RDP and SF measures during 2004-06. In other words, this is a "business as usual" assumption;

2. Scenario 1 – **Reallocate Funding to only Public Sector Investment and NO envelope**: area payments and funds for RDP investment measures for business development are transferred to public social and economic infrastructure measures with none going to direct payments or private investment.

3. Scenario 2 – **Enhanced Financial Envelope for Latgale but with NO reallocation:** increased funds for the same regional RDP measures of 2007-2013 in Latgale and the same area payments support flows under Pillar 1 and II of the CAP;

4. Scenario 3 – **Reallocate Funding to only Public Sector Investment AND with enhanced envelope**: area payments and funds for RDP investment measures for business development are transferred to public social and economic infrastructure measures with none going to private investment, AND increased funds for regional RDP measures of 2007-2013 in Latgale.

Presentation of Results

In this section, main results from the policy scenarios are presented in terms of impacts on macroeconomic indicators (real GDP and employment levels) and sectoral effects (factor income and distribution of household income). The effects of the policy scenarios are measured as deviations from the "No Latgale Financial Envelope" scenario.

Real GDP at Factor Cost

Results indicate that all scenarios will have positive impacts on total real GDP of both rural and urban areas (Table 1), with effects in the rural area being higher. Comparing the three scenarios, the "Investment in Public Sector with envelope" scenario increases more the total and regional (rural/ urban) GDP; and, in particular, the generated impacts are twice compared to the "Enhance Financial Envelope" scenario. However, the positive effects in both cases are smaller than changes in the different sectors of the regional economy.

Turning to rural and urban GDP effects, results show that the model predicts higher positive effects in the case of the rural sectoral GDP. In the case of the rural region, sectoral GDP effects have different sectoral distribution and they are positive, except for the negative effects in the primary sectors from the both "Investment in Public Sector" scenarios. Specifically, the "Enhanced Financial Envelope" scenario raises more the GDP of the primary sector while "Investment in Public Sector with envelope" affects more the GDP of the tertiary sector. Also, the GDP of the secondary sector is increased from the implementation of the scenarios. This reflects increases in allocative efficiency from the removal of coupled support and the transfer of funds from area payments to public investments in the rural region.

In the urban region there is a different picture of impacts concerning the distribution of sectoral effects. The "Enhance Financial Envelope" scenario continues to increase more the GDP of the

primary and the secondary sectors as in the rural region. However, both "Investment in Public Sector" scenarios (with and without envelope) increase more the GDP of the urban secondary sector while the effects in the tertiary sector are the lowest.

The most important finding from the implementation of the scenarios is that the impacts in rural sectoral GDP are different among the three scenarios due to the fact that funds are allocated towards different investments. The reason why rural total GDP increases more from the scenarios that deal with the transfer of funds to the public sector can be explained by the fact that funds are allocated to sectors that are labour and capital intensive, which means that they are important in the formation of the rural GDP.

Table 1 - Aggregate Impacts on Real GDP at Factor Cost (% changes)

	No Latgale Envelope (1000 LVL)	**Investment in Public Sector and No Envelope (%)**	**Enhanced Financial Envelope (%)**	**Investment in Public Sector with Envelope (%)**
Rural Area	***207.756***	**1,08**	***0.82***	***1.64***
Primary	34.688	-7,00	1.46	-5.74
Secondary	50.663	1,55	1.12	2.00
Tertiary	122.405	3,18	0.51	3.57
Urban Area	***318.155***	**0,24**	***0.15***	***0.36***
Primary	714	0,32	0.29	0.14
Secondary	109.710	0,76	0.20	0.91
Tertiary	207.731	-0,03	0.13	0.07
Total	**525.911**	**0,57**	**0.42**	**0.86**

Employment Effects

All scenarios have positive skilled employment effects. The "Enhanced Financial Envelope" scenario increases more the skilled employment levels of the rural and urban primary sector. Also, due to high linkages of the primary sector with the secondary sector, a considerable increase in the skilled employment levels of the rural secondary sector is recorded. In contrast, the "Investment in Public Sector with envelope" scenario has clearly the best total skilled employment impacts but it is negative for the rural primary sector due to the shift of area payments to investment. The higher impacts in total employment are due to the high positive impacts in the employment of the rural tertiary and secondary sectors which result from the focus on public infrastructure investment. These sectors are also labour intensive and, consequently, in order to produce more they demand more workers.

In the case of unskilled employment levels, the sectoral distribution of effects has the same direction as skilled employment effects. However, percentage changes are a little bit lower for unskilled employment levels. The only difference is observed in the rural tertiary sector where unskilled employment effects increase more from the implementation of the two policy scenarios compared to skilled employment levels.
In conclusion, it can be said that the "Investment in Public Sector with envelope" scenario has the largest increases in total, rural and urban skilled and unskilled employment levels, but this is due to the labour intensive sectors to which funds are allocated.

Table 2 - Skilled and Unskilled Employment Effects (% changes)

	No Latgale Envelope (FTEs)		Investment in Public Sector and No Envelope (%)		Enhanced Financial Envelope (%)		Investment in Public Sector with Envelope (%)	
	Skilled	Unskilled	Skilled	Unskilled	Skilled	Unskilled	Skilled	Unskilled
Rural Area	***30.963***	**9.898**	**4.05**	**4.04**	***1.32***	**1.28**	***4.94***	**4.45**
Primary	2.042	544	-1.87	-1,88	4.24	4.24	-2.25	-2.25
Secondary	6.487	2.846	3.98	0.78	1.97	1.67	4.34	1.02
Tertiary	22.439	6.509	5.26	6.32	0.83	0.84	5.76	6.71
Urban Area	***42.006***	**12.915**	**0.42**	**0.31**	***0.30***	**0.18**	***0.70***	**0.52**
Primary	128	0	0.22	0	0.73	0	0.34	0
Secondary	12.245	5.347	1.43	0.97	0.40	0.21	1.72	1.11
Tertiary	29.636	7.568	0.08	0.07	0.25	0.16	0.15	0.10
Total	**72.996**	**22.791**	**2.97**	**1.56**	**0.94**	**0.59**	**3.38**	**1.99**

Factor Income

Factor income changes provide the most general indicator of labour and capital incomes (Table 3). All scenarios give positive effects in the income of both rural and urban labour and rural and urban capital factors, with the "Investment in Public Sector with envelope" scenario giving the highest impacts. Also, all three scenarios seem to affect more the income of rural labour factors; that is, rural unskilled, skilled labour and rural capital.

Table 3 - Impacts on Factor Income (% changes)

Factors	No Latgale Envelope (1000 LVL)	Investment in Public Sector and No Envelope (%)	Enhanced Financial Envelope (%)	Investment in Public Sector with Envelope (%)
R-Unskilled Labour	249.386	3.74	1.28	4.45
R-Skilled Labour	862.786	4.00	1.32	4.94
U-Unskilled Labour	415.860	0.30	0.18	0.52
U-Skilled Labour	1.367.259	0.49	0.30	0.70
Urban Capital	1.380.206	0.45	0.34	0.66
Rural Capital	788.159	3.01	2.20	4.74

Household Income

The impacts of the policy scenarios on the distribution of income of different household categories are presented in Table 4. In the case of agricultural households, the "Enhanced Financial Envelope" scenario has the highest incomes, which is due to the direct transfer of area payments to their budgets. In contrast, the "Investment in Public Sector with envelope" scenario results in a very big decrease in the income of agricultural households, because area payments are transferred to investment support for public infrastructure. However, the increased investment support has the ability to result in highest positive impacts on the incomes of the rest of rural and urban household categories. Rural local households and those urban households working in rural areas benefit from the largest income increases. An important finding is that all scenarios result in positive diffusion of impacts towards the income of urban households.

Table - 4 Impacts on Household Income (% changes)

Households	No Latgale Envelope (1000 LVL)	Investment in Public Sector and No Envelope (%)	Enhanced Financial Envelope (%)	Investment in Public Sector with envelope (%)
Rural HHS	**249.761**	**-13,38**	**1.12**	**-12.56**
Rural Local	30.153	3,18	1.40	4.15
Rural Commuter to the Urban area	32.841	1,68	0.80	2.25
Rural Commuter to the RoW	14.160	1,50	0.75	2.05
Agricultural HHS	172.608	-20,36	1.15	-19.29
Urban HHS	**318.846**	**0,70**	**0.42**	**1.00**
Urban Local	282.806	0,56	0.38	0.83
Urban Commuter to the Rural area	26.077	2,42	0.89	3.01
Urban Commuter to the RoW	9.963	0,33	0.22	0.49
Total HHS Income	**568.607**	**-5,48**	**0.72**	**-4.96**

Conclusions

This analysis has focused on the description of distribution of effects that result from the implementation of three alternative policy scenarios for the Latgale region. The results show that each scenario is predicting different qualitative and quantitative impacts in total and also in sectoral effects as well as differences in the distribution of effects between its rural and urban parts.

Comparison of the "No Latgale Envelope" scenario to the "Enhanced Financial Envelope" reveals the positive impacts of the increased financial allocation to Latgale Region. The addition of this extra funding resource has the effect of increasing all the indicators related to employment, GDP, and factor income even though area payments remain the same as in the "No Latgale Envelope" scenario. Also, this scenario seems to affect more positively the primary and secondary sectors, and that is due to increased investments in the agriculture and agribusiness sector.

The comparative analysis of the scenario results show that in terms of GDP, the two scenarios concerning the investment in Public Sector have the same distribution of effects but in the case of the scenario with no envelope the resulted effects are lower. The "Investment in Public Sector with Envelope" scenario is the one that leads to the largest increase in the total and regional (rural-urban) GDP. Focusing on the aggregate sectoral effects, it seems that this scenario increases the GDP of the rural tertiary and urban secondary sectors more, while the "Enhanced Financial Envelope" scenario has the ability to increase the GDP of the rural primary sector more. In the "Investment in Public Sector with Envelope" scenario, rural GDP has a net increase despite the fact that removal of area payments reduced agricultural GDP. This means that non-agricultural employment and economic activity increases enough to more than offset the loss of jobs and economic activity in the primary and related secondary sectors. The strongest growth is in the rural tertiary sector, since that encompasses all the public sector activity that is emphasized in the investment priorities. Factor incomes for rural skilled and unskilled labor and for rural capital are the highest in this scenario.

Overall, the results suggest that in order for an economy to have a good economic performance it's

not only about enhanced funding but is about the targeting of these funds to the more productive sectors of the economy. These would be the sectors that have the highest linkages within the economy and have the potential to create strong direct and indirect effects spread to the regional economy. In particular, the "Investment in Public Sector with Envelope" scenario is the one that leads to the strongest positive effects both in the rural and also in the urban part of the region. These effects are mainly attributable to the positive effects that are recorded in the tertiary sector and also in the positive effects that are recorded in the tertiary and secondary commodities. As for the "Enhanced Financial Envelope" scenario, it is the one that affects more the primary sector in both areas.

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CREDITS FOR SERBIAN AGRICULTURE IN THE TRANSITION PERIOD

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The possibility for self-financing in agriculture is very small, primarily due to lower labour productivity leading to lower rate of surplus value. Therefore, in the development of Serbian agriculture, special importance is attached to other sources of financing such as: the Agrarian budget, i.e. credits of the Ministry of Agriculture, Forestry and Water Management; credits of business banks; development funds; leasing companies.

With the reconstruction of the Serbian banking system in 1994, the primary issue, as an important source for financing agriculture used primarily for current reproduction, was abandoned. Due to transition to a market economy system and cancellation of financing from the primary issue, economic entities in agriculture have found themselves in a very unfavourable position. Therefore, in 2004, the Ministry of Agriculture, Forestry and Water Management started, for the first time, with lending credits to agricultural entities. The source of money is the Agrarian budget of Serbia. Besides this important source for financing agriculture, the paper also analyses other mentioned sources for lending credits to Serbian agricultural entities in the transition period, i.e. from 2004 to 2008.

Key words: credit lending, agriculture, agricultural budget, transition

Introduction

Agricultural sector of Serbia have been significantly restructured during the past years. Among the major internal constraints is the shortage of financing sources which has also been stated as a problem in other transitional countries. Limited access to European funds and modest capabilities of the economy to cope with the burden of necessary changes also had a negative impact on the tempo of the reform.

Measures, instruments and actions taken by the state through the implementation of specific agrarian policy in order to promote agricultural development depend, primarily, on its real financial capabilities. Financing of agriculture can be achieved by self-financing or credit lending. Agriculture is the area of production with low accumulation capacity, which means that the possibility of self-financing is very small. This is primarily due to allocating a part of accumulation generated in agriculture for the development of other activities, as well as the lower labour productivity leading to lower rate of surplus value. Therefore, in the development of agriculture, special importance is attached to other sources of financing. The main sources of financing Serbian agriculture are:

- ✓ The Agrarian budget, i.e. credits of the Ministry of Agriculture, Forestry and Water Management, at beneficial interest rates
- ✓ Credits of business banks
- ✓ Development Funds
- ✓ Leasing companies.

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The aim of this paper is to analyse, using the available data, the basic conditions for lending credits to entities in the Serbian agriculture in the transition period, i.e. from 2004 to 2008. In particular, the most important source of agricultural credit lending has been analysed, i.e. credits provided from the agrarian budget of Serbia, starting from 2004, based on the Programme of measures for stimulating the development of agricultural production by the Government of the Republic of Serbia.

The Agrarian Budget

With the reconstruction of Serbian banking system in 1994, the National bank primary issue, as an important resource for financing of agriculture, used primarily for current reproduction, was abandoned. Cancellation of financing agriculture from the primary issue, with transition to a market economy, has additionally hardened already unfavourable economic position of agricultural entities. Important source of funds has been discontinued, and the new one has not been provided yet. Agriculture has lost the status of a privileged sector in financing and has been left without any permanent and safe financing source for its specific use. Hence the establishment of the agrarian budget, as appropriation from the total budget of Serbia, represented a significant contribution to stimulation of agricultural and rural development. During the year 2004, the Ministry of Agriculture, Forestry and Water Management started with building the financial market in order to provide stable and long-term source for financing of agriculture. According to the Programme of measures for stimulating the development of agricultural production, the Government of the Republic of Serbia renewed subsidized credit lines to farmers in a completely new way compared to the earlier practice. Subsidised credit users are only registered farms (natural and legal persons). During the first year, the resources were distributed partly through business banks (short-term credits for natural persons – registered farms and long-term credits for legal entities and natural persons), and partly through the Fund for the Development of the Republic of Serbia (long-term credits for legal entities and natural persons). At the end of 2005 the Fund for stimulation of the development of agricultural production in the Republic of Serbia was established, as a sub-account of the Ministry of Agriculture, Forestry and Water Management for financing all types of credits in the subsequent years. Sources of financing this Fund are the resources provided in the budget of Serbia for the current year, the funds collected from the repayment of credits and other funds realised in accordance with the law.

Credits are lent to farmers through the Fund for stimulating the development of agricultural production, business banks, the Ministry of Finance – Treasury Administration and the Guarantee fund. Business banks in the service of credit loans of the agrarian budget have been selected on the basis of a tender called for by the Ministry of Agriculture, Forestry and Water Management.

Credit mechanism includes the following types of credits: *Short-term credits* – for natural persons and *long-term credits* – for legal and natural persons. The total amount intended for servicing credit from the agrarian budget in the analysed period decreased from the maximum of 3.7 billion RSD (17.5% of the agrarian budget) in 2004, to 2 billion RSD (or about 8% of the agrarian budget) in 2007 (Table 1).

Table 1 – Structure of credits financed from the agrarian budget in the period 2004-2008

Year	Type of credit				Credits in million RSD	
	Short-term		Long-term			
	RSD	% share	RSD	% share	Planned	Paid*
2004	1,700	45.9	2,000	54.1	3,700	3,727
2005	1,500	42.9	2,000	57.1	3,500	3,460
2006	1,500	42.9	2,000	57.1	3,500	3,400
2007	500	25.0	1,500	75.0	2,000	2,500
2008	1,850	65.0	1,000	35.0	2,850	...

* Data from the internal documentation of the Ministry of Agriculture, Forestry and Water Management

Source: Author's calculation based on data taken from the Serbian Government's Act on establishing the Programme of measures for stimulating the development of agricultural production, for the corresponding years

Short-term credits are intended for the purchase of working assets (seeds, fertilizers, fodder etc.). The procedure for obtaining short-term credit is simple. The farmer applies to one of the banks for the credit enclosing the documentation required and the resources are being transferred to his purpose account. Credit lines are approved by the business bank which has a signed agreement with the Ministry of Agriculture, Forestry and Water Management on the use of credit lines intended for agriculture. If the bank decides to approve the application it sends a guaranty to the Guarantee Fund which checks all the criteria which need to be fulfilled, and issues a confirmation on credit approval. The repayment deadline is 12 months, and the interest rate was 6% (5% interest + 1% Guarantee Fund commission) at the annual level, without a currency clause. The needs for short-term credits were much greater than the planned amounts of resources, so credits had to be limited with farm size. Loans were linked with farm size (up to 1ha, 1-5 ha, 5-10 ha, up to 10 ha) and maximum payment was 12,000 - 240,000 RSD, or 150 - 3000 euros. If the users do not meet the requirements for the short-term credits, they are put on the black list of the Ministry of Agriculture, Forestry and Water Management preventing them from acquiring any of the credits and any of the subventions of the Ministry.

In 2008, the form of credit lending was changed with the adoption of the Regulation on establishing the Programme of measures for subsidizing the interest rate for short-term credits agricultural and food industry. The Programme is being conducted by the Ministry of Agriculture, Ministry of Finances – Treasury Administration, through the Fund for stimulating of the development of agricultural production and business banks. Short-term credits were approved with the repayment deadline of 12 months and maximum annual fixed effective interest rate of 15% (without currency clause), and the Ministry of Agriculture subsidises 10% of it. This allowed granting short-term credits with the maximum annual interest rate of 5%. Credit potential for short-term credits has been increased manifold by involving all the Serbian business banks in lending credits for agricultural and food production. Depending on the assessment of creditworthiness of the applicant, the highest credit approved by bank is 500,000 RSD.

Long-term credits of the Ministry of Agriculture, Forestry and Water Management from the agrarian budget are approved for the following purposes: construction and purchase of irrigation systems and equipment; purchase of agricultural machinery; establishment of orchards, construction of plastic and glass greenhouses; investments in livestock production. The Ministry provides 90% of these resources and the remaining 10% are the obligation of banks. The business

bank nominates the investment programme of the applicant for the use of long-term credits with the Ministry of Agriculture, which, in accordance with the contract signed between the Ministry and business banks, regulating closer terms, criteria and the way of approving long-term credits, makes a decision upon the request.

Table 2 - Long-term credits disbursed from the agrarian budget, according to their purpose in 2005 and 2006

Purpose of credits	2005		2006	
	RSD	(%)	RSD	(%)
Irrigation systems	180,000,000	10.5	10,177,600	0.8
Glass houses and green houses	135,090,000	7.9	60,607,200	4.5
Establishment of orchards	159,570,000	9.4	46,568,000	34
Procurement of machinery	-	-	267,088,080	19.8
Livestock production	1,232,000,000	72.2	965,232,306	71.5
Total	**1,706,660,000**	**100.0**	**1,349,673,186**	**100.0**

Source: Author's calculation based on the internal documentation of the Ministry of Agriculture, Forestry and Water Management

Credit is granted for a period of 5 years, except for establishing plantations of vines and nuts, with the repayment deadline of 10 years. Annual effective interest rate was 2.25%, with 0.75% annual Guarantee Fund commission. Currency clause – establishing the credit amount and annual repayments payable in euros, is applied with the obligation of the user to pay the annuity due in the equivalent value in RSD, according to the official middle exchange rate of the National Bank of Serbia, which applies on the day of payment. Grace period, which is included in the credit repayment period, is up to 12 months, except when the credits are granted for the construction and purchase of the system and equipment for irrigation, financing a part of animal production and establishment of orchards – when it amounts up to 3 years and 5 years for raising plantations of vines and fruit tree species, respectively. The amount of funds approved on the credit contract ranges from the minimum of 5,000 euros to the maximum of 200,000 euros in the equivalent value in RSD according to the official middle exchange rate of the National Bank of Serbia.

According to the Regulation on establishing programme of measures for long-term credits of agricultural and food production for 2008, Ministry of Agriculture introduced certain measures. Maximum annual effective interest rate is 12.5%, and the Ministry of Agriculture participates for 10%. This form of subsidies allows much higher credit potential i.e. the involvement of all business banks in lending credits to agricultural and food production and provision of more favourable credit conditions compared to the previous commercial ones. The user who is granted a long-term credit under certain conditions by some of business banks is entitled to subsidies. The lowest credit approved is 5,000 euros, and the highest one has been extended to 300,000 euros depending on the credit worthiness of the client. The repayment deadline was 3-5 years (except for establishing plantations of vines and nuts, where the repayment deadline is 10 years). The currency clause is applied. The repayment deadline is 12 months with a 12-month grace period, excluding construction and purchase of irrigation systems and equipment, financing a part of livestock production, establishment of orchards (2 year grace period at least) and raising plantations of vines and nuts (at least 4 years).

Total number of registered farmers who were granted credits from the agrarian budget

increased from 24,995 in 2005 to 59,502 in 2007, whereas the number of long-term credit users significantly decreased (Table 3). The total amount of money from the agrarian budget intended for lending credits to registered farms was increased by the inflow of money from the repayment of credits granted in the previous years.

Table 3 - Number and amount of paid short-term and long-term credits from the agrarian budget, and repayments in the period 2004-2007.

Year		Total paid* (budget + repayment)		Total (short-term + long-term)
		Short-term credits	Long-term credits	
2004	number of credits	28,125	788	28,913
	amount	1,727,473,000	2,258,617,356	3,986,090,356
2005	number of credits	23,342	1,653	24,995
	amount	1,460,000,000	2,241,181,893	3,701,181,893
2006	number of credits	27,040	1,190	28,230
	amount	3,315,335,000	1,259,125,943	4,574,460,943
2007	number of credits	59,343	159	59,502
	amount	6,687,223,600	159,769,992	6,846,993,592

***** These amounts relate to credits granted according to the Regulation for the current year, but payment was made also the next year Source: Author's calculation based on the internal documentation of the Ministry of Agriculture, Forestry and Water Management

Credits of business banks

In the current economic situation banks in Serbia are not too interested in giving loans to farms. Business banks prefer lending credits to agricultural enterprises and cooperatives. During 2005 there were 25 banks approving agricultural credit loans under different conditions and for different purposes.

Conditions for *short-term agriculture credits of business banks* in 2005 (excluding those in the service of purpose credit loans of the agrarian budget) were usually similar. Short-term credits were intended for the following purposes: purchase of inputs, i.e. working capital for organizing agricultural production or for the purchase of agricultural products and the preparation of commodities for export and for ensuring liquidity. The repayment deadline was 3-12 months, the credit amount was limited by credit worthiness and client reliability, and the monthly interest rate was 1.0-2.5%, i.e. 27-29% annually.

Long-term credits of business banks (excluding those for the purpose of servicing purpose credit from the resources of the agrarian budget) were primarily intended for the purchase of agricultural machinery and other equipment, followed by the purchase of the basic flock. However two banks were lending credits for land purchase and privatization (Privredna banka and Agro banka). The repayment deadline was 3-5 years depending on the purpose. Credits were limited by credit worthiness and client reliability and ranged from 5,000-220,000 euros. In general, the annual

interest rate ranged from 10-12%. Depending on the type of the credit, usually warranted funds were: mortgage, collateral, bill forms, bank or bailer guaranty, endorsers. The above mentioned conditions may be considered unfavourable and still insufficiently adapted to the specific properties of agricultural production.

Leasing companies

In Serbia, the development of the system of financial leasing started with the adoption of the Act of the Republic of Serbia regarding financial leasing in May 2003 ("Official Gazette of the RS", No. 55/03 and 61/05). The establishment of the domestic leasing enterprise "Lipaks" was initiated in November 2003 by the Government of Serbia, with the objective of ensuring favourable conditions for the purchase of tractors, agricultural machinery, trucks and specialized vehicles of domestic producers. The major users of leasing facilities, or agricultural machinery, were private farmers (because they were offered the restoration of dilapidated agricultural machinery under relatively favourable conditions). In June 2004, the nine leading leasing companies in Serbia founded the Association of Leasing Companies (ALCS). The foundation of the Association had been initiated by SEED Programme of the World Bank for the enhancement of small- and medium-scale enterprises in Southeast Europe. Since 2005 the conditions for leasing have been favourable with a somewhat lower interest rate (3% at the annual level) for agricultural machinery and 5% for other leasing facilities.

Development funds

The Development Fund of the Republic of Serbia was established in 1992. The resources are used for financing programmes in the field of economic and regional development, the encouragement of small and medium-scale enterprises, financing export encouragement, financing the economy for liquidity and financing regular Fund activities. The credits offered from the resources of the Fund can either be short-term or long-term credits.

Short-term credits, among other things, encouraged the export of the products of agro-industrial enterprises.

Long-term credits were used for financing the following programmes: credits for small- and medium-scale enterprises with the aim of encouraging the harmonization of regional development; credits for private shops and entrepreneurs; as well as micro-credits for employing workers left without a job in the process of transition and are registered as unemployed at the National agency for employment.

Fund for agricultural development of Vojvodina Province was established in 2001. This fund provided credits with a one-year grace period, and a repayment period to 3 years at a 2.5% interest rate[4].

Fund for the development of Vojvodina was founded in 2002. Privatisation procedures participate with 50% in the source of the capital. The resources are intended for credit financing of the development of SME's and farms. A significant part of the total resources was used for credit financing of agricultural industry.

Local (municipal) funds

4 Appropriations for 2006 were 1.037 billion, and in 2007, 1.284 billion RSD.

Some municipalities in Serbia provide also in their budgets the resources for co-financing credits intended for encouraging the development of agriculture and rural areas.

Conclusions

During the transition period, the agrarian sector in Serbia has been significantly restructured. However, great internal constraints are related to the lack of the financing sources. The transition to a market economy system, reconstruction of the banking system in 1994, and cancellation of financing from the primary issue, caused the deterioration of the economic position of economic entities in agriculture. Insufficient access to the European funds and modest capabilities of the economy to cope with the burden of necessary changes also had a negative impact on the tempo of the reform.

Since agriculture is a field of production with lower accumulation capacity, the possibility of self-financing is small, hence the special importance for the development of agriculture is attached to other sources of financing, i.e. credit lending. The existing sources for financing Serbian agriculture are the agrarian budget, business banks, leasing companies and development funds (republican, provincial and municipal). However, although they have enormous significance for the overall development of agriculture and rural areas, especially in the transition period, these sources do not provide an adequate level, or the conditions for lending credits to agricultural entities.

Establishment of more efficient financial market, adapted to the specific needs of the agricultural sector, requires further institutional and organizational adjustments.

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EVALUATING OPERATORS' SATISFACTION AND POTENTIAL OF LOCAL RESOURCES FOR RURAL TOURISM: EVIDENCE FROM MATSUURA IN JAPAN

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Abstract

As rural tourism evolves into diversification, the connection between the individual and local resource management is becoming an important issue for the sustainable evolution of rural tourism. To explore this point, we investigated conceptually and empirically whether rural tourism operators' individual satisfaction enhances utilization of local resources and, if so, what mechanism works for it by focusing on rural tourism accompanied by an educational program, i.e. a farm-stay with farm and rural experience services implemented as a part of school trips in Matsuura, Japan. From statistical tests and an econometric estimation based on a questionnaire survey of rural tourism operators we found that operators' individual satisfaction gained from interchange with visitors and direct feedback can positively enhance locally exerted effects that stimulate operators to recognize opportunities within their community and raise the potential for local resource use. Thus, we should strengthen this connection to eventually create a new viable activity.

Key words: rural tourism, operators' individual satisfaction, utilization of local resources, feedback effect from visitors

Introduction

As activities of rural tourism have become diverse, the demand for rural tourism is becoming more and more experience oriented (Ohe, 2007). One of these trends in diversified rural tourism is typically observed in the combination of an educational program with rural tourism in Western European countries and Japan. These diversified activities with an educational function open a new possibility for farm activity in response to diversifying the social needs of agriculture and rural areas in this century (Shichinohe et al., 1990). The educational function of rural tourism gives mainly urbanites a chance to experience farm and rural life and the significance of its cultural heritage. Specifically, here we focus on rural tourism accompanied by an educational program as a farm-stay with farm and rural experience services implemented as a part of school trips.

To cope with these new trends, it is increasingly important for operators to have a wider perspective not only on their own individual management, but also on local resource management. It is often pointed out that operators gain satisfaction through providing services by receiving immediate feedback from consumers (Wilson, 2007) due to the nature of rural tourism, which is a service good that is directly interchanged between producers and consumers. This is the major difference from the provision of traditional farm products that are simply trucked to urban markets. This nature of interchange between operators and visitors gives operators an opportunity to rediscover local resources and eventually to come up with an idea for a new activity (Ohe, 2007). Especially,

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we can expect that rural tourism that includes an educational program provides a more substantial interchange effect among the people involved.

To tackle the issue, we employed a methodological individualistic approach since we investigated whether operators' individual satisfaction enhances the utilization of local resources and, if so, what mechanism works for it. The preceding studies, as mentioned in detail in the literature review, can be classified into the ones that utilized a methodological individualistic approach and the others that utilized community-based or aggregated performance approaches. In contrast, our approach tries to bridge the gap between the two approaches.

First, we conduct conceptual considerations whereby operators' individual satisfaction with the educational program can enhance locally exerted effects that stimulate operators to recognize opportunities within their community and that raise the potential for local resource use. Second, we conduct empirical analyses on rural tourism with an educational function, i.e. farm-stay school trip programs implemented in Japan, with an econometric model to verify the relationship between individual satisfaction and effects on local resource utilization. Finally, we suggest policy implications on the evolution of diversification of rural tourism.

Literature review

With respect to operators' individual attitudes on rural tourism activity, the motivation of rural tourism operators has been studied (Nickerson et al., 2001; McGehee and Kim, 2004; Ollenburg and Buckley, 2007). Skuras et al. (2005) conducted a comparative study on the effects generated from the difference in human capital among European countries. Telfer (2000) interviewed farmers in rural Indonesia on the adoption of agritourism and indicated tourism can act as a generator of community development. Maestro et al (2007) studied consumer's attitude toward rural tourism on perceived quality and the moderating role of familiarity. There has been, however, no study on how the individual satisfaction of operators is connected with the utilization of local resources.

In the field of studies on the utilization of local resources, the cultural aspects of local resources have attracted attention (Barbič, 1998; Hammer, 2008). As a software aspect of local resources, Yokoyama and Sakurai (2006) focused on the relationship between social capital and community development in Asian countries, including the case of rural tourism in Japan. Garrod et al (2006) conceptually presented an idea of countryside capital to consider the connection between rural resource use and rural tourism.

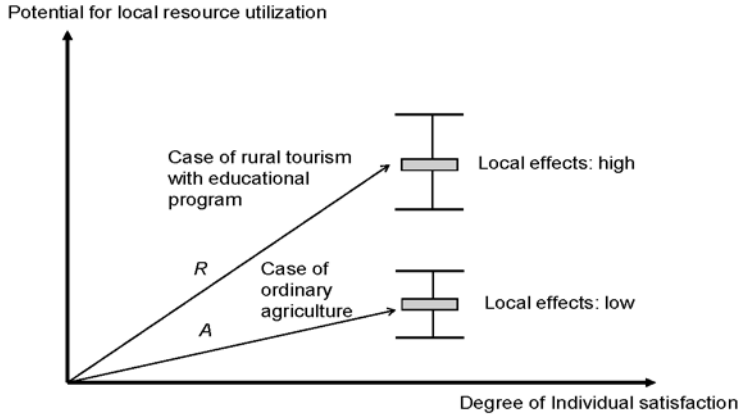
Local effects brought about by rural tourism have been approached from various aspects: socio-economic effects (Maude and van Rest, 1985), impact assessment by local residents (Rátz, 2008; Petrzelka et al., 2005), and economic effects (Slee et al, 1997). These studies clarified the social and economic effects of rural tourism on the local community and their significance and thus contributed to progress in impact evaluation on rural tourism. Nevertheless, these studies on local economic effects tended to implicitly assume that study areas were already sufficiently developed to grasp clearly visible economic effects. These cases represent, however, a few of the best areas where full-sale economic effects have emerged. Ordinary rural areas have not reached the stage whereby economic effects are readily visible, but are at the preliminary stage before the emergence of visible economic effects. Likewise, in the case of these new services such as the farm and rural experience services studied here, neither a viable market has been established nor are local economic effects apparent. It is, therefore, natural to assume that the degree of local resource utilization is enhanced not directly, but gradually until the next stage of full-scale local economic effects have emerged. In summary, how individual effects or operators' individual satisfaction connect with the effects on local resource utilization at the preliminary stage of the emergence of economic effects has not been

investigated empirically. To evaluate this connection, the results of these preceding studies suggest that it is necessary to consider operators' perception in terms of economic and non-economic aspects, features of rural tourism with an educational program, and stages of local resource utilization in the of local community.

Analytical framework - Effect of the potential for local resource utilization: gradual enhancement hypothesis

It is considered that in the case of rural tourism that includes experience services, the feedback that operators receive from consumers will be greater than that for traditional farm products. This feedback, which is characterized as a non-economic benefit, can complement economic benefits. Given this point, a working hypothesis is presented here. We assume that the enhancement of the potential for local resource utilization is a necessary step as a preparatory stage for full-scale realization of local economic effects. Figure 1 symbolically illustrates that there is a difference between the case of conventional agriculture and the case of rural tourism in terms of the degree of the elevating effect of the potential for local resource utilization.

Generally, the case of rural tourism with an educational program will enhance the potential for local resource utilization to a greater degree than the case of farming. This is because operators' encounters and exchange with visitors from outside the area enable operators themselves to become newly aware of local resources that they did not recognize prior to the extension of a human network outside of the local community. This recognition subsequently leads to the enhancement of the potential for local resource utilization by arrow *R*. This effect on local resources can be higher than the ordinary rural tourism.



Note: vertical range indicates variance (SD), square in the centre indicates most frequent level

Figure 1 Relationship between individual satisfaction and potential for local resource utilization

Conversely, in the case of ordinary farm activity without rural tourism this effect will remain at a low level even if it exists (arrow *A*). The difference between the two activities depends on the existence of interchange and feedback. Through rural tourism with educational services local people can obtain new and objective perspectives brought by people from outside the community and find previously unnoticed valuable resources and eventually a way to utilize them. We call this a feedback effect on raising the potential of local resource utilization through interchange with people inside and outside of the local community. This effect is caused by participatory

activity that creates an opportunity to receive direct feedback from consumers. Because of this feedback, farmers' satisfaction will be higher than that from ordinary farm activity.

Feedback will easily occur with provision of all service goods mainly due to the trait of service goods in that both production and consumption happen simultaneously (Hicks, 1971; Hill, 1999). Why, however, does this feedback extend to work as an enhancer of the potential for local resource initialization? There are several reasons that can be uniquely found in rural tourism. First, rural tourism is tourism that originally utilizes local resources. Second, the farm-stay program just started a few years ago in the area examined in this paper, which means that there is still much room for utilization of local resources. Third, there are externalities generated along with rural tourism activity such as the educational function of the rural heritage and local food culture. The fact of exerting externalities means that provided services are not fully compensated and it often happens that experience services are offered free of charge. This behavior comes from the traditional rural mentality that gives gratis hospitality to visitors. In other words, this informality or incompleteness of rural tourism with experience services as an economic good becomes one of the factors the impresses visitors and eventually leads to a new possibility of local resource utilization.

Outline of study area

The study area, Matsuura, is located in the Kita Matsuura Peninsula in Nagasaki on the island of Kyusyu in western Japan. Initially, deregulation in accommodation facilities by the prefecture stimulated the start of farm-stay programs for school children in this area. In Matsuura, the farm-stay school trip was launched in 2003, and Matsuura is one of the leading areas in terms of hosting trips of this category in this country. There are 13 hamlet-based bodies that are capable of accommodation and these bodies are organized into one local association that is accountable for coordination, external marketing, and development of new experience services and provision of a training program for operators.

This association is supported by municipal and prefectural governments with regard to funding and staffing. The total capacity of accommodation in this area is 2 000 people a night. Although 500 farm and fishing farm households are registered, there are actually only 4 proactive bodies among the 13 bodies. In 2006, 10 101 students and teachers from 58 schools, mainly from the Tokyo Metropolitan area and the Kansai area, the second densely populated, stayed in Matsuura. Among the 58 schools, junior high schools accounted for 77% of such trips and high schools 19%, meaning that junior high schools are the primary customers. With regard to the duration of the farm-stay among 63 schools that conducted farm-stays and excluding schools that only used hotel and inns, one-night stays accounted for 75%, two nights for 14% and day trips for 9%.

Survey method and data

Before completing the questionnaire survey for the collection of data, we conducted a preliminary interview survey of the people concerned, i.e. leaders of the hamlet group, officers of the municipality, and officers of the local association, in Matsuura in August 2007. Based on this information, we made the final questionnaire-survey after consultation with the funding bodies for this research, i.e. the Ministry of Agriculture, Forestry and Fisheries (MAFFJ), and the contracted national organization as the coordinator, i.e. the Organization for Urban-Rural Interchange Revitalization (OURIR). We asked 23 questions, soliciting information on profiles of respondents, such as age, sex, years of experience as a provider of the services, kinds of services offered, how providers felt about providing the service and whether they gained satisfaction from what they offer. The survey forms were distributed through the association for rural-experience tourism in Matsuura to 100 farm or fishing operators who provided farm-stay accommodations and rural experience services in the

four most active hamlets of this study area. The association selected proactive farm operators and asked those actually conducting tourism activities to complete the surveys through the leader of the hamlet group, who then returned them to OURIR by mail. There were 65 respondents.

Profiles of respondents

More than half of the respondents were female. Among the various age groups, those in their 50s accounted for more than 40% and represented the largest group while those in their 60s were the second largest group, comprising one third of the respondents. The youngest respondent was 43 years old and the eldest was 80. The average age was 59 years, indicating that middle-aged and senior wives were the main bearers of responsibility for farm-stay rural experience activities. Local food experience, farming experience and fishing experience were the three major services with respect to the menu of rural experiences in this area. Nearly half of the respondents offered only one service and 40% offered two services, so the provision of more than three services was not common. Among those who offered two services, the combination of farming and local food services tended to be offered by farmers. Half of the respondents accommodated fewer than 50 visitors a year, and 40% accommodated 50-100 visitors; only a few respondents hosted over 100 visitors annually.

Operators' satisfaction and index of potential for utilization of local resource

Table 1 show from results of the questionnaire survey, first, as an actual indicator of an operator's individual satisfaction, over 90% of respondents felt a sense of reward for provision of experience services.

Table 1. Private effect on operators: Do you feel sense of reward?

Evaluation	Yes	Somewhat yes	Neither nor	Somewhat No	No	No answer	Total
(%)	83.1	10.8	1.5	1.5	0.0	3.1	100.0
Frequency	54	7	1	1	0	2	65

Second, on the subject of local effects, over half of the respondents answered that they were embracing "a sense of local pride", which was the most common answer (Figure 2). This rising self-confidence among local people enabled them to abandon their groundless mental barrier or inferiority complex toward urbanites and to assume a forwarding-looking attitude. Therefore, this positive feeling can be a precondition to build an equal urban-rural relationship in the future. In sequence, the rediscovery of unrecognized local resources, the activation of communication among locals and the building of a network with urbanites followed in this order. Stated differently, we can say that a widening perspective of operators in terms of not only inward looking, but also outward looking is occurring. Further, fewer respondents indicated effects related toward the actualization of a new activity, such as coming up with an idea for a new activity and putting into practice a new activity. To sum up, it should be noted that rather than directly formulating a new idea and initiating an activity, these local effects took a stepwise form from low to higher stages in the order of rising self-awareness and self-confidence, rediscovery of local resources, building of open human network, coming up with a new idea, and eventually putting into practice a new activity.

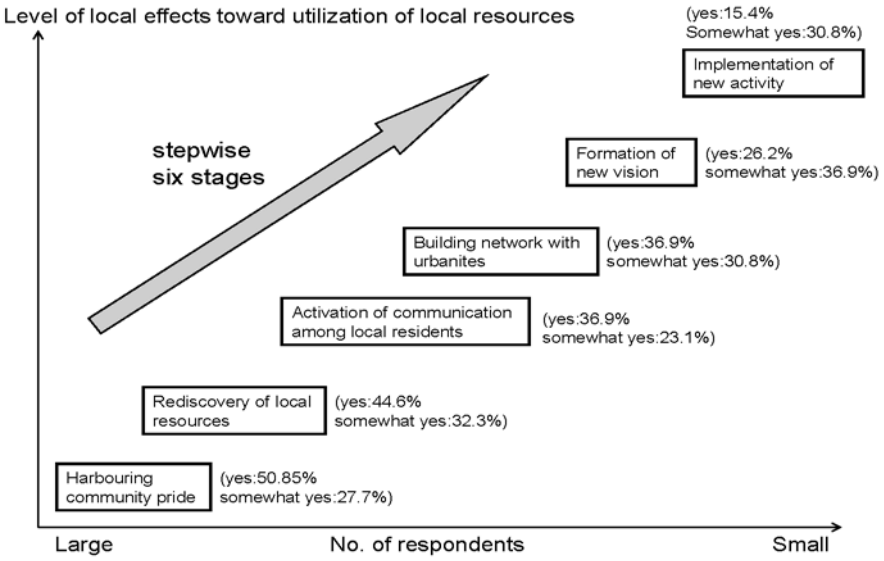


Figure 2 Stages of local effects from the operators' response

These facts suggest that the order among these six effects from the lower to higher effects is not inconsistent. If every local effect gets the highest score, which is five, the sum of these six effects will be the maximum value of 30 per contra. If the lowest score is obtained for each local effect, the sum will be a minimum value of six. We summed up the score of a five-point Likert scale for the six effects, and the average value was 24.6, with a maximum value of 30 and a minimum value of 17. Consequently, it is safe to say that the higher the sum, the higher the potential for local resource utilization and that we are able to use the sum of these six effects as a comprehensive indicator of the potentiality of local resource utilization. We conducted the normality test of distribution (Shapiro-Wilk's W test) and found that the null hypothesis of normality was not rejected. The advantage of this score is that it is easily calculable and quantitatively manageable for the evaluation of the local effects, so we term this score the "index of potential for local resource utilization".

To sum up, it was revealed that operators felt satisfaction in terms of non-economic effects rather than economic effects and that not only individual effects but also local effects were expressed. It was also revealed that local effects evolved in order starting from harboring community pride, rediscovery of local resources, widening the scope of their network, and eventually to the formation of a new vision and the implementation of a new activity. In this respect, evolving and widening perspectives through the enhancement of the sense of community pride will be an important first step leading to the stage of subsequent full-scale local economic effects.

These local effects have not been considered in the case of ordinary farm production and were not generated fully until experience-oriented rural tourism activity started. These effects work on basic conditions that are present to prepare for the next stage of full-scale economic effects. Thus, we can say that the index of potential for local resource utilization will be an effective indicator of local effects in the preliminary stage. We examine how this index connects with the individual satisfaction of operators below.

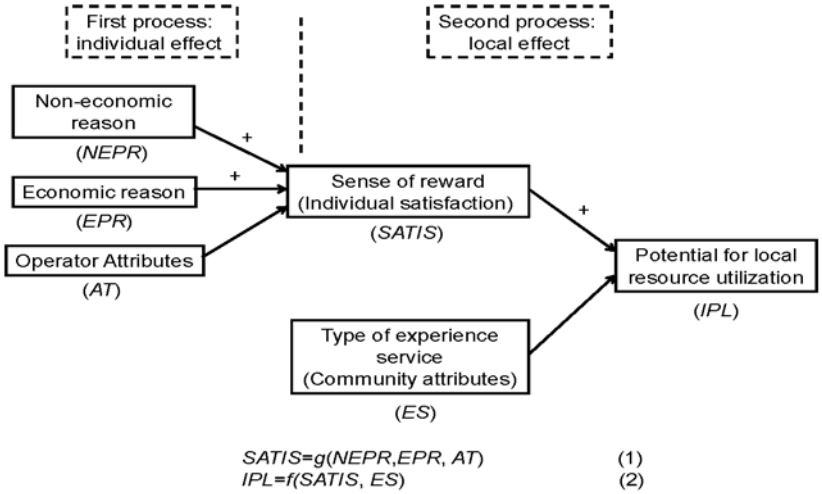
Regression analysis of factors determine the potential for local resource utilization

Given the statistical analysis above, the following structural model is presented to empirically clarify how individual satisfaction actually results in enhancement of local resource potential (Figure 3).

We assume that the process that connects individual effects and local effects has two sub-processes: one connected with individual effects (individual process) and the other connected with local effects (local process). The former individual process stipulates that the economic reasons that those operators provide experience services and the non-economic reasons and operator's attributes determine operators' individual satisfaction. The latter local process stipulates that individual satisfaction and types of experience services (community attributes) determine the degree of the potential for local resource utilization. Given this working hypothesis, we can expect positive sign conditions for these three working factors to raise the potential for local resource utilization. The signs of operator and community attributes will be determined empirically.

We use the index mentioned earlier as an actual variable for the potential for local resource utilization (*IPL*). Other variables in equation (1) are as follows based on the preliminary findings: a variable for an economic reason (*EPR*), expectation of income gain (five-point Likert scale), and a variable for a non-economic reason (*NEPR*), the enjoyment of teaching rural culture (five-point Likert scale). We used a common indicator, the operator's age for the attribute (*AT*).

Although in the preliminary estimation we tested the operator's years of experience in providing this service and the number of visitors hosted by an operator for the variable for an operator attribute, neither case showed a good result. With respect to the variables in equation (2), we used the estimate of individual satisfaction (*SATIS*) from equation (1) and



$$SATIS = g(NEPR, EPR, AT) \quad (1)$$

$$IPL = f(SATIS, ES) \quad (2)$$

Figure 3 Relationship between the individual satisfaction and the local effects

the types of experience services (*ES*) as follows: food and farming experiences=1, other experiences=0. As the variable for individual satisfaction, we used sense of reward (yes=1, no=0). At the preliminary trial estimation, although we used each of the individual effects for the *SATIS* variable, there was no

other variable that generated a far better result than that of a sense of reward. The types of experience services provided were also able to distinguish between fishing and farming villages. This is a clear indicator that tells the difference between the two communities because food and agriculture experiences are only offered by operators in farming villages. In this respect it can be implicitly assumed that the social capital is reflected in these village characteristics. In taking into account of endogeniety of the operators' individual satisfaction, this model was a simultaneous estimation model. Actually we estimated a logic model for equation (1) and then with the estimate of the individual satisfaction gained from equation (1) we estimated equation (2). The sample size was 44. This is because we needed to use all data on local effects to obtain the unbiased potential estimate for local resource utilization, so we excluded samples with missing observations on local effects.

Results

The results are tabulated in Table 2. Adjusted *R* square was not high, probably because all of the variables were qualitative variables and there is no other similar study for comparison. Nevertheless, every parameter was statistically significant (up to 10% significance) and the sign conditions were satisfied, so we can interpret them and accept these results.

Table 2. Estimation results of determinant function of the potential for local resource utilization

Effects	Individual effects	Social effects
Variables	Individual satisfaction	Potential for local resource utilization
Economic reason (expectation of income, 5-point scale)	1.4666* (1.77)	- -
Non-economic reason (fun in teaching, 5-point scale)	2.1115** (2.01)	- -
Operator's age	0.2190** (2.12)	- -
Individual satisfaction (estimate)	-	5.7564** (2.41)
Type of experience service (food+farming experience, yes=1, no=0)	-	4.0981*** (3.31)
Constant	-22.8075 (-2.32)	18.3472*** (8.55)
Estimation method	Logit model	TSLS
LR chi-square	15.51***	-
Ajst R^2	-	0.2539
RMSE	-	3.4455
Sample size	44	44
vif	-	1.0
Heteroscedasticity (Breush-Pagan Test)	-	n.s.

Notes: ***, **, * indicate 1%, 5%, 10% significance and not significance, respectively. Figures in the parenthesis are Z values for logit model and *t* static for TSLS.

We found neither serious multicollinearity from the value of vif nor heteroscedasticity (Breusch-Pagan test). Now let us examine results in detail. In equation (1) although both economic and non-economic reasons positively worked on individual satisfaction, the non-economic reason worked stronger than the economic. The parameter of the operator's age was positive, which means that

the elderly operators gain higher satisfaction than younger operators. In equation (2) the parameter of estimated individual satisfaction was positive, which means that our hypothesis that operator's individual satisfaction works on the local resource potential was supported. Parameter of food and farming experience services was positive, which indicates that the combination of food and farming experience services enhanced the potential of local resource utilization and the local resource potential in farming villages was higher than that in fishing villages partly because of the different mentality in people between the two types of villages.

To summarize, the results demonstrate that what matters most to raise the local resource potential is that operators enjoy themselves performing the service. Although this point is often stated by rural tourism operators, it has not been confirmed empirically and quantitatively. The results clarified the working factors for this mechanism. In this respect, food and agriculture experience programs should be extended and improved in quality as well.

Conclusions

This paper investigated conceptually and empirically how operator's individual satisfaction enhances the local resource potential based on a questionnaire survey of operators of farm-stay programs for students on school trips in Matsuura, Japan. Although further research is needed to more widely generalize the results, the following main points were disclosed.

(1) Farming experience services are characterized as newly emerging services that utilize local traditional food culture and farming techniques that are often forgotten in modern life. The one unique feature is that close interchange and direct feedback can happen between operators and visitors and that this interchange generates not only individual effects, but also local effects.

(2) We defined an 'index of potential for local resource utilization', which is calibrated from survey data. This index expressed local effects from initial psychological confidence of the operators themselves, rediscovery of local resources through the extension of human networking, and higher stages of a new idea and its realization in terms of rising potentials for local resource utilization.

(3) From an econometric estimation, we confirmed that individual satisfaction works as an enhancer of local resource potential. Among individual effects, the non-economic effect rather than the economic effect is more closely connected with higher local effects. This means that non-economic based satisfaction is effective for evoking local resource potentials in stages.

(4) As policy implications, we should recognize the positive connection between individual satisfaction and local resource potential and therefore strengthen this connection to realize a new viable activity eventually. In this respect, the coordinator's role as a go-between will be increasingly important to successfully connect between operators and consumers as briefly mentioned in this paper. This topic should be examined in further research.

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MEDICINAL AND AROMATIC PLANTS (MAP) – A CHAIN OF COMPETITIVENESS IN ROMANIAN AGRICULTURE

Victor Manole[1], Cristian Popescu George[2], Sorin Davitoiu[3]

Abstract

On agro-food products' market of the European Market a saturation of products has been reached, attaining the stage of limitation, by means of certain policies and specific levers, of the expansion of this market. Romania faced the situation of member state of EU, when, after year 2006, it entered a harsh competition, in which the predominant word is saturation. This is the reason for which the post-accession studies in agriculture must aim both at valorizing the natural potential of not-exploited or less exploited resources of Romania, and at finding out solutions to increase competitiveness of the field, in which Romania feels threatened, aiming first of all at the markets of traditional products. Competitiveness is based on criteria of economic efficiency, according to which an important place takes the rational and efficient exploitation of the natural resources, especially in agriculture.

In order to point out the significance of MAP cultures, we will make a comparison of some indicators of efficience of the wheat, corn, colza cultures and several medicinal plants which were cultivated and studied. The comparison will be made taking into consideration both the data of average efficiency in case of MAP (using classical technologies, without applying the knowledge discovered by the researches of the field), and the maximal ones on the crops and MAP cultures (by application of knowledge resulted from agronomic research specific for the improvement of the technology of each species of MAP).

This field MAP is so much the more important for Romania as this country owns elements of environment favourable for a potential exploitation of the medical aromatic plants, without affecting the traditional cultures in the agricultural areas.

Medicinal and aromatic plants (MAP) chain in Romania

At present, in Romania, as everywhere in the world, a special interest is manifested for the use of medicinal and aromatic plants. The medicinal flora of our country is represented[4] by 800 species, of which 283 have indubitable therapeutic properties. Of the approximatively 180 species studied from the pharmacodynamic point of view, for approximately 50 species, the basic elements of the culture technologies were established.

The cultivated medicinal and aromatic plants are represented by annual, biennial and perennial species, whose products are capitalized: flowers (flores), leaves (folium), grass or entire aerial

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4 Popescu Cristian George, Manole Victor, Boboc Dan, Economical and Healthy Efficiency of Naturist Treatments, international conference "Multifunctional Agriculture and Rural Development II - Rural Values Preservation", Beocin, December 2007, DIS PUBLIC D.O.O. Publishing House, Belgrad, ISBN: 978-86-82121-47-3, pp.496-504,

vegetative part (herba), fruits (fructus), seeds (semen), roots (radix), etc.

Active therapeutical principles are a part of the chemical composition of the medicinal and aromatic plans. It should be specified that the active principles constitute peculiar, specific substances and they are of interest only when are formed in big quantities, that is their presence can justify the medical use of a plant. Among the active principles contained by the medicinal plants attention is drawn to the carbohydrates - glucose, starch, fixed oils, pectines, mucilages and gums, fixed oils, organic acids, glycosides, saponosides (saponines), tan materials (tannines), bitter principles, alkaloids, antibiotics, vitamins, essential oils and others.

MAP chain breaks through the pattern of the agricultural products, for several reasons:

- First of all, the vegetal resources originate in nature; starting from the peculiarity of spontaneus MAP (spontaneous flora) the cultivation of valuable species (from the point of view of their capitalization within the chain) was achieved. In our country, there are several institutes of MAP research.[5]
- Due to favourable environmental factors acting in our country[6] we have a great diversity of plant species.
- Due to different MAP species from Romania, with many uses (both in field of human health and in other fields[7]) by exploiting such cultures (in association with or interchangeable with other agricultural productions), the farmer can create a permanent, competitive advantage, by capitalization of varieties of plants demanded on market. Also, MAP can have a double or triple role, in agricultural exploitation. Through the fungicide character of certain MAP species, they can be used both for the protection of different conventional cultures and for their capitalization (double role), but especially can be used with ecologic cultures aiming at environmental preservation, cultures protection against pests, and also their capitalization on the market (triple role).
- MAP, are cultures adaptable to peculiarities of agricultural exploitation of Romania
- Due to the geographical position, of the proportionalness of the environmental factors from our country, MAP represent a very important natural resource, derivates of whom, being in the chain, can represent an area of niche on the markets of agro-food products from Europe. Massive exports of berries and other MAP registered by the Forests Grounds, once again prove this fact. Besides, these elements of efficiency will be developed more in my doctor's degree thesis.
- MAP represents a multidisciplinary, complex and dynamic field of knowledge. All this because the efficiency of the study of plant species, represents the work of many specialists from different fields (medicine, pharmacology, botanics, agronomy, economy).

Appearantly, three big categories of products taking the path of MAP chain would be distinguished in Romania:

- Medicinal and aromatical plants represent an important source of raw material for the pharmaceutic industry (pharmaceutical products). Modern pharmacopoeia contain a minimum percentage of 25% medicines resulted from plants and many others, achieved on synthetic structures, on prototype compounds, isolated from plants. At this category,

5 The following research resorts are concerned with this issue: SCPMA Fundulea, SCAZ Secuieni (Neamț), SCCCPN Dăbuleni (Dolj), resort „Stejarul" Pângărați-Piatra Neamț, ICCP București, ICCF

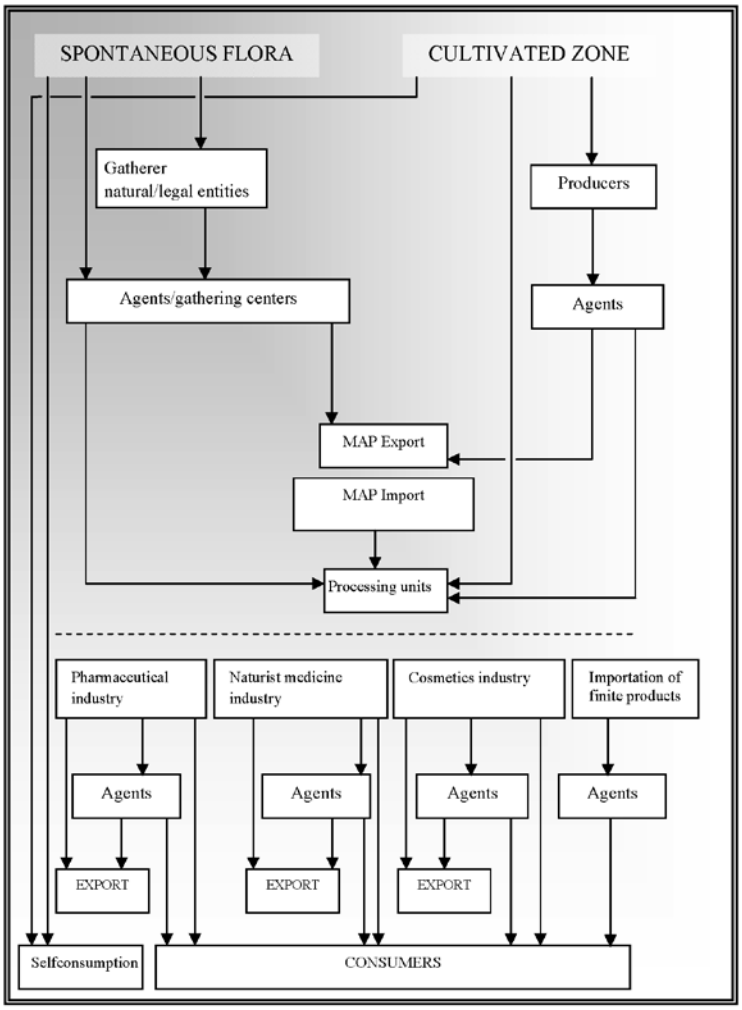
6 I have explained at full the diversification of the environmental factors from our country in the Intermediary Report

7 Brought back to present day, these species represent sources of raw material for extraction of active principles and essential oils, with an especial value for the drugs industry and

similar products with other destination besides the human consumption are added;

- Plants consumed fresh or the basic products resulted from MAP that have known a minimum degree of processing and are destined in a high proportion to self consumption. In this category enters the tea, but also other products as alcoholic extractions from plants of the type - tincture, bitter, and many others. Besides, phitotherapy (science concerned with treating diseases with herbs) is the most ancient treatment method mentioned also in ancient writs[8]. This category represents the shortest and best individualized chain. World Health Organization estimates that 80% of the population of the developed countries relies on traditional medicine[9].
- Use of medicinal and aromatic plants in cosmetic industry.

The above mentioned, schematically, can be synthetized in the folowing manner:



In the first part of the chart, up to the processing units, MAP chain is formally presented.

8 to be uniquely identified the plants have a latin denomination, and the species of plants recognized as medicial from ancient times, bear the name of officinalis

9 WHO Strategy for Traditional Medicine 2002-2005, Geneve, p.vi., September, 2002

Cultivated MAP efficiency – comparative study in some crops of social significance (wheat, corn, colza) and MAP cultures

Without doubt, one of the most important links of the chain of MAP derivated products represents the agricultural producers. In order to point out the significance of MAP cultures, we will make a comparison of some indicators of efficience of the wheat, corn, colza cultures and several medicinal plants which were cultivated and studied. The comparison will be made taking into consideration both the data of average efficiency in case of MAP (using classical technologies, without applying the knowledge discovered by the researches of the field), and the maximal[10] ones on the crops and MAP cultures (by application of knowledge resulted from agronomic research specific for the improvement of the technology of each species of MAP).

Crt.nr.	Plant denomination	Importance/Use[1]
1	Cassia angustifolia	Laxative, purgative
2	Echinacea spp.	Increases the selfdefence system of the body, inhibits multiplication of the viruses, antitumoral, healing up, antiinflamatory action – urologic, gynecological
3	Glycyrrhiza glabra	Treats ulcers, gastritises, has a mucolytic, antitussive effect, immunostimulator, treats the inflammation of the skin
4	Grindelia robusta	Antispastic, envigorating, with cardiac properties, regulates the beats of the heart - treatment of bronchitises, asthma, pulmonary emphysema, whooping cough
5	Melissa officinalis	Stimulates the digestion, treats aerophagia and flatulence, calms the gastric aches, treats insomnia, irritability
6	Plantago spp.	Treats external diseases of the skin, bronchitises, has expectorant, antiinflammatory, antispastic effect
7	Satureja montana	Stimulates digestion, indigestions, lack of appetite
8	Tropaeolum majus	Hepatobiliary drainer, external usage, fights hair loss
9	Veronica officinalis	Diuretic, expectorant, in migraines
10	Withania somnifera	Stimulates the immunity, antiinflammatory, general envigorator, treates the anxiety, in big doses induces sleep

Selected cultures:

- Wheat and corn: are the most spread cultures in Romania[11] with particular social importance (wheat ensures the bread of the population, corn is the main fodder for the animals);
- Colza: has a special significance within the present context of global energetic crisis[12]
- Medicinal plants (table above).

10 Data of maximum efficiency are taken from SC Aectra Inv. SA, having as object of activity the implementing and marketing of agricultural technologies with maximum outputs, as well as from the research data resulted from reseach resort for Medicinal and Aromatic Plants Fundulea.

11 According NIS the surfaces cultivated with wheat and corn were of 2476 and 2628,5 thousands ha respectively, in year 2005.

12 Work developed and presented by Victor Manole, Nicolae Istudor, Cristian George Popescu, Chiva Rogoz, The Prospect Of Regenerable Energy And Of Biofuels in Romania, in vol. International Symposium "CAP and Euro-regions Development Policies in EU 25/27, Agricultural Policy Modelling in the Pre and Post-Accession Period. Experiences and Expectations", Ed. ASE, Bucuresti, 2007, pag. 300-305

The comparative study will be done on intensive cultures that will not depend on influence of the external factors, or the dependence is neglectable, so that we can compare the output of different cultures in different years.

Data related to lucrativeness of colza, wheat and corn culture will be extracted from a study I have made and published in collaboration with other authors, in year 2007, as well as from the studies carried out by SC Aectra SRL (on provided agricultural technologies), Cited data are average values registered in year 2006:

Culture / Costs	Colza	Wheat	Corn
Treated seed (€/ha)	24	30	26
Total treatments (€/ha)	9.5	16.5	12
Chemical fertilizers (€/ha)	32	50	35
Mechanic works (€/ha)	95	125	150
Other expenses (€/ha)	40	20	50
Total costs (€/ha)	200.5	241.5	273
Average production on ha (kg/ha)	1,700	2,500	3,700
Average price (€/t)	240	100	85
Capitalized production (€/ha)	408	250	314.5
Profit on exploitation (€/ha)	207.5	8.5	41.5

Source: Victor Manole, Nicolae Istudor, Cristian George Popescu, Chiva Rogoz, the Prospect of Regenerable Energy and of Biofuels in Romania

An increased efficiency is noticed at the colza plantations as against the traditional crops under the terms of application of modern exploitation technologies. In the following table we have data collected from the reports of the Research Resort of Medicinal and Aromatic Plants Fundulea, by two categories of technologic efficiency:

A. In normal technological conditions

Year of prod.	Species	Used part	Estim. prod. (kg/ha)	Price ($/kg)	Costs of prod. ($/kg)	Incomes obtained ($/ha)	Adherent expenses ($/ha)	Profit of expl. ($/ha)
1	Cassia angustifolia	Herba	700	2.2	2.8	1540	3080	860
		roots	400	6.0		2400		
1	Echinacea spp.	Herba	1000	3.3	2.4	3000	2400	600
3		Roots	500	8.0	5.0	4000	2500	1500
3	Glycyrrhiza glabra	roots	400	6.0	4.7	2400	1880	520
2	Grindelia robusta	herba	1500	1.8	1.2	2700	1800	900
2	Melissa officinalis	leaves	1500	3.0	1.8	4500	2700	1800
1	Plantago spp.	Herba	1500	1.1	1.15	1650	1851	569
		Roots	110	7.0		770		
2	Satureja montana	Herba	1600	1.9	1.4	3040	2240	800
1	Tropaeolum majus	Herba	800	2.15	1.6	1720	1280	440
2	Veronica officinalis	Herba	430	2.5	1.13	1075	559	516
1	Withania somnifera	Herba	920	2.0	2.28	1840	2964	1460
		Roots	380	6.8		2584		

B. In improved technological conditions

Year/ pro.	Species	Used part	Estim. prod. (kg/ha)	Price ($/kg)	Costs of prod. ($/kg)	Income obtained ($/ha)	Adherent expenses ($/ha)	Profit of expl. ($/ha)	Estim. additional profit ($/ha)
1	Cassia angustifolia	Herba	1100	2.3	2.8	2530	4620	1320	460
		roots	550	6.3		3410			
1	Echinacea spp	Herba	1350	3.2	2.5	4320	3375	945	345
3		roots	630	9.0	5.8	5670	3654	2016	516
3	Glycyrrhiza glabra	roots	650	6.7	5.5	4355	3350	1005	875
2	Grindelia robusta	herba	1950	1.9	1.3	3705	2535	1170	270
2	Melissa officinalis	leaves	1970	3.4	2.1	6698	4137	2561	761
1	Plantago spp	Herba	1650	1.3	1.2	2145	2376	959	390
		roots	170	7.0		1190			
2	Satureja montana	herba	2000	2.0	1.5	4000	3000	1000	200
1	Tropaeolum majus	herba	1200	2.25	1.7	2700	2040	660	220
2	Veronica officinalis	herba	670	2.7	1.5	1809	1005	804	288
1	Withania somnifera	Herba	1060	2.0	2.5	2120	3250	1970	510
		roots	450	6.8		3060			

Source: data collected from Agral Program – Improvement and development of technologies at the Research Resort for Medicinal and Aromatic Plants Fundulea

Indicators of MAP cultures lucrativeness are calculated both under the terms of application of the classical technologies of culture, without taking into account the specific feature of each plant, but also in improved technological terms, but also considering the specific of the plant, as well as other research elements that after being implemented have had as a consequence the growth of production and finally the growth of the profit for each species of plant taken into consideration.

A. In normal technological conditions

			Values updated rectified		Values rectified transformed	
Year/ prod.	Species	Used part	Profitul rectificat($/ ha)	Rectified add. profit ($/ha)	Rectified profit (euro/ha)	Rectified additional profit (euro/ha)
1	Cassia angustifolia	Herba	980.4		781	
		Roots				
1	Echinacea spp.	Herba	684		545	
3		roots	570		454	
3	Glycyrrhiza glabra	roors	197.6		157	
2	Grindelia robusta	herba	513		409	
2	Melissa officinalis	leaves	1026		818	
1	Plantago spp.	Herba	648.66		517	

			Values updated rectified		Values rectified transformed	
Year/ prod.	Species	Used part	Profitul rectificat($/ ha)	Rectified add. profit ($/ha)	Rectified profit (euro/ha)	Rectified additional profit (euro/ha)
		roots				
2	Satureja montana	Herba	456		363	
1	Tropaeolum majus	herba	501.6		400	
2	Veronica officinalis	herba	294.12		234	
1	Withania somnifera	Herba	1664.4		1327	
		roots				

B. In improved technological conditions

Yea/ prod.	Species	Used part	Profitul rectificat ($/ha)	Rectified add. profit ($/ha)	Rectified profit (euro/ ha)	Rectified additional profit (euro/ha)
1	Cassia angustifolia	Herba	1504.8	524.4	1199	418
		roots				
1	Echinacea spp	Herba	1077.3	393.3	859	313
3		roots	766.08	196.08	611	156
3	Glycyrrhiza glabra	roots	381.9	332.5	304	265
2	Grindelia robusta	herba	666.9	153.9	532	123
2	Melissa officinalis	leaves	1459.77	433.77	1164	346
1	Plantago spp	Herba	1093.26	444.6	871	354
		roots				
2	Satureja montana	herba	570	114	454	91
1	Tropaeolum majus	herba	752.4	250.8	600	200
2	Veronica officinalis	herba	458.28	164.16	365	131
1	Withania somnifera	Herba	2245.8	581.4	1790	463
		roots				

A high level of lucrativeness of MAP cultures (profit of exploitation varies between 304 and 1790 EURO) can be noticed, the most lucrative culture in improved technological conditions, is for *Withania somnifera,* whose profit can reach 1790 euro/ha, as against the colza culture (which takes the top place among the three crops), for which only 207.5 euro/ha are gained. Thus, a value of the profit from exploitation with up to 762.65% bigger in favour of the medicinal plant can be noticed. The advantage of the crops taken into consideration would be that the technologies are completely push button, being applicable on extended areas, while for MAP there is no complete push button technology, generally being cultivated on limited areas.

Conclusions

MAP has a special significance, being used under different forms, first of all for amelioration of human health. MAP, as raw material, on the path of the plant chain in our country takes three important directions (besides the export, as such):

- pharmaceutical industry;
- naturist medicine industry;
- cosmetics industry.

MAP collected from the spontaneous flora ensures a high level of self-satisfaction of own needs by self-consumption, but due to their credentials of being ecologic, they are equally demanded at export. MAP cultures have several advantages:

- MAP can have a double or triple role, in agricultural exploitations. Due to the fungicide character of some species of MAP, they can be used both for protection of different conventional cultures and then for their capitalization (double role), but especially can be used near the ecologic cultures aiming at environmental preservation, protection of the cultures against pests, and their capitalization on the market (triple role).
- They can be equally used in completion of other cultures, being good precursories, medicinal plants can be capitalized also on less productive lands, and ensure the cultivators significant incomes.
- They have a high lucrativeness as against other crops, but most of them have non-mechanized or partly mechanized technologies, making their exploitation on bigger surfaces of land very difficult to achieve.

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REGIONAL ASPECTS OF AGRICULTURAL INCOME LEVEL IN VOJVODINA PROVINCE IN FUNCTION OF BASIC PRODUCTION FACTORS

Katarina Čobanović[1], Emilija Nikolić-Đorić[2], Beba Mutavdžić[3]

Abstract

In the present research the analysis of the level of national income in agriculture was done for different districts and municipalities of the Province of Vojvodina.

The analysis of the achieved level of national income in agriculture in function of the most important factors was performed on the base of classical form the traditional non-linear regression model of Cobb-Douglas production function with labour and capital as predictors and on the extended form of Cobb-Douglas function which in addition includes the arable areas.

Key words: National income in agriculture, Cobb-Douglas production function, investments in agriculture, agricultural population

Introduction

During the 80s of XX century, European Union countries were closely focused on enhancing development of rural areas aiming to achieve a coherent economic development. The tendencies were to diminish the differences between the city and the country (urban vs. rural), as well as to replacing the activities in agriculture by activities related to agriculture, etc (Stojanović, 2006). European Union Countries have been actively engaged with fostering development of rural regions and establishing rural development policies, as well as deciding on and improving the list of rural development indicators (Bryden, 2003). Defining the basic indicators of rural development is one of the essential requirements for international comparison (Stojiljković, Bošković, 2008). International organizations, such as OECD, EU and others, make remarkable effort to establish the list of indicators of rural development.

The level of development of municipalities in Serbia was measured on the basis of several indicators. In this paper, the indicator for determining municipality development was the corrected national income per capita in 2005. The correction of the national income was provided by two-year average of the national income of agriculture from 2004 and 2005. Ranking of the municipalities was conducted according to the value of indexes of the national income per capita with the level of the Republic of Serbia taken as the basis for comparison (Municipalities in Serbia, 2006, 2007). On the basis of such ranking of Serbian municipalities – according to the above stated indicator – only one

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municipality in Vojvodina (the place of Zitište, rank 47) belongs to the group of underdeveloped municipalities. There is no Vojvodinian municipality belonging to the group of the most undeveloped municipalities. Regarding other municipalities, 8 municipalities from Vojvodina are ranked in the top 20 Serbian municipalities. These are the following ones: Apatin (rank 13), Bačka Palanka (rank 16), Bela Crkva (rank 8), Beočin (rank 6), Vršac (rank 10), Kikinda (rank 15), Novi Sad – city (rank 7) and Senta (rank 19). The highest ranks are occupied by municipalities of the city of Belgrade**.** In 2005. total number of municipalities of Serbia was 162, while Vojvodina Province had 45 municipalities.

The above presented indicators of the level of development of Serbian municipalities suggest that Vojvodina, as one of the three regions in Serbia, belong to the group of developed regions. Serbia is divided into the following regions: Region 1 (the lowland region) includes the regions of Bačka, Srem, Banat and a part of Mačva; Region 2 covers the northern part of central Serbia (Šumadija, part of Mačva and Stig); Region 3 (the mountainous and highland region) includes the eastern, southern and western parts of Serbia (Bogdanov, 2007). Regarding the development of the Vojvodinian regions, it is pointed out in the literature that from the 90s the western part of the Province, i.e. Bačka and Srem, is generally speaking more developed compared to the eastern part, i.e. Banat (Bogdanov, 2007). This paper shall compare the level of development of these 3 regions – Bačka, Banat and Srem – at the level of the Autonomous Province. It would certainly be far more suitable for the analysis if the level of development could be measured at the level of settlements or municipalities or counties. However, the availability of the published statistical data is restricted and, therefore, these three regions are compared.

The aim of this paper is comparison of these Vojvodinian regions according to the share of rural population in the total population, the share of national income from agriculture in the total national income and according to estimated models of Cobb-Douglas production function.

Data and methods

The paper uses the data provided for municipalities and districts of Vojvodina on the national income from agriculture in 2005. The recorded data on investments in agriculture in 2004 in municipalities and districts of Vojvodina are to show whether there is an effect of the investments from the preceding year in terms of the achieved income level from agriculture in the following year. Furthermore, the study uses the data on active agricultural population, as well as the data on cultivable land, on arable land and gardens. Regression analysis is employed here in order to determine the behavior of dependent variable (national income from agriculture) in relation to the combinations of two independent variables (agricultural population and investments in agriculture, active agricultural population and investments in agriculture). The national income from agriculture and investments in agriculture are given in thousands of Serbian diner currency (RSD).

The research uses the model of multiple linear regression with two independent variables and the model of curvilinear regression of Cobb-Douglas function type with two independent variables. The general form of Cobb-Douglas function is the

following: $Y = AL^{\alpha}K^{\beta}e^{\varepsilon}$, where Y is the dependent variable (production), L represents the labour input (the first independent variable), K represents the capital input (the second independent variable), and $\eta = e^{\varepsilon}$ is a random variable with log-normal distribution. The parameters α and β are indicators of elasticity of labour and capital (http://en.wikipedia.org/wiki/Cobb-Douglas). Since the results of χ^2 test prove that the distribution of the dependent variable Y statistically has no significant deviation from log-normal distribution, the model of Cobb-Douglas function is by logarithmic transformation turned into multiple linear regression with two independent variables in which the random errors have normal distribution: $\ln Y = \ln A + \alpha \ln L + \beta \ln K + \varepsilon.$

The adequacy of the model is determined by application of residual tests: Lagrange Multiplier Test (LM) which examines the presence of serial residual correlation, ARCH LM, and White Test for determining conditional heteroskedasticity of residuals (Gujarati, 1995). The calculations were conducted by applying **STATISTICA 8.0** and Eviews 3.1 programmes (Asteriou, 2007).

Research results

According to OECD criterion, the regions are divided into three types: predominantly rural regions if more than 50% of population live in rural communities; intermediate (or mixed) if 15-50% of population live in rural communities; and predominantly urban regions if less than 15% of population live in rural communities (Bryden, 2003).

The classification of the districts of Vojvodina according to the share of rural population in municipalities indicates that in the majority of districts predominantly rural or mixed regions dominate. Only in the northern Banat district and the south Bačka district there are municipalities that are characterized as extremely urban. The northern Bačka district, the middle Banat, the south Banat and Srem districts have more rural than intermediate municipalities. The northern Banat and western Bačka districts have more intermediate than predominantly rural municipalities. The southern Bačka district has the same number of predominantly rural and intermediate municipalities.

Table 1 - Classification of the municipalities of Vojvodina according to the share of rural population

DISTRICT	Rural	Intermediate	Urban	Total
Northern Bačka	2	1	0	3
Middle Banat	3	2	0	5
Northern Banat	2	3	1	6
Southern Banat	5	3	0	8
Western Bačka	1	3	0	4
Southern Bačka	5	5	2	12
Srem	4	3	0	7
Total	22	20	3	45

In 2005 in Vojvodina only 3 municipalities were predominantly urban, 22 were predominantly rural, while 20 municipalities are characterized as belonging to the mixed type of rurality. Accordingly, Vojvodina and its regions have the profile of an extremely rural area (Table 1).

The share of the national income from agriculture in the overall national income (%) in 2005 is high and it is the highest in the middle Banat district (47.5%). It is followed by the southern Banat district (45.4%), Srem (44.4%), northern Bačka (41.3%), northern Banat (35.6%), southern Bačka (34.3%), and finally the western Bačka district (28.9%) presented in Table 2.

Table 2 - Share of the national income from agriculture in the total national income (%) in the districts of Vojvodina

Districts		$\overline{X}$	C_V (%)	X_{min}	X_{max}
Northern Bačka	1997	34.64	39.21	18.97	43.07
	2002	38.60	55.70	15.90	58.60
	2005	41.30	51.50	17.90	59.40
Middle Banat	1997	55.60	41.48	20.80	74.00
	2002	45.10	45.31	17.71	66.45
	2005	47.49	36.76	17.20	61.75
Northern Banat	1997	36.91	25.23	22.81	47.62
	2002	30.96	39.09	19.05	52.11
	2005	35.56	36.47	18.50	54.80
Southern Banat	1997	49.88	46.59	14.37	79.28
	2002	47.52	44.29	13.22	69.44
	2005	45.40	43.84	13.99	68.33
Western Bačka	1997	28.64	36.45	14.10	65.72
	2002	27.99	52.20	7.87	41.42
	2005	28.86	30.87	18.07	38.88
Southern Bačka	1997	40.32	46.45	14.10	65.72
	2002	37.34	53.23	9.71	72.48
	2005	34.30	64.89	4.87	77.51
Srem	1997	50.11	40.07	32.43	81.27
	2002	48.20	38.64	24.13	74.92
	2005	44.43	45.00	22.43	82.37

Applied model of Cobb-Douglas function in double logarithmic form for Vojvodina was

$$\ln \hat{Y} = \underset{(9.40^{**})}{5.599013} + \underset{(4.42^{**})}{0.841785} \cdot \ln X_1 + 0.1412163 \cdot \ln X_2, \; R^2 = 0.8321, \; \overline{R}^2 = 0.8233,$$

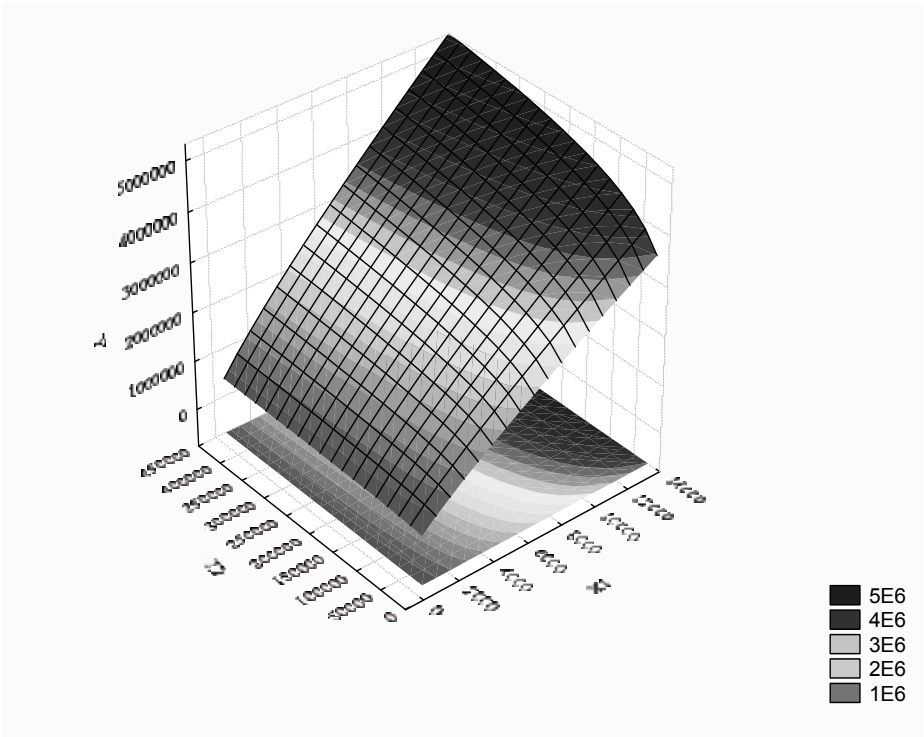
The specified model of Cobb-Douglas function indicates that the achieved national income from agriculture of Vojvodina in 2005 (Y) is strongly influenced by the both analyzed variables: agricultural population (X_1) and investments in agriculture (X_2). By applying

the Wald test the hypothesis on homogeneity of the parameters of (F = 0.040571, p = 0.8414) model has been confirmed.

Graphical presentation in three-dimensional space illustrates the relation of the dependent variable and independent variables (Figure1):

Figure 1 - Applied model of Cobb-Douglas function

$$\hat{Y} = 270.15063 X_1^{0.84178} X_2^{0.14216}$$



In order to determine whether there are regional differences in the degree of influence of the analyzed factors on the national income from agriculture, the regression models of the same form were applied for Bačka, Banat and Srem:

$$\ln \hat{Y} = \underset{(7.02^{**})}{5.47089} + \underset{(2.36^{*})}{0.886188} \cdot \ln X_1 + 0.125807 \cdot \ln X_2, \; R^2 = 0.8790, \; \overline{R}^2 = 0.8629,$$

$$\ln \hat{Y} = \underset{(4.67^{**})}{4.162296} + \underset{(1.28)}{1.073061} \cdot \ln X_1 + 0.078459 \cdot \ln X_2, \; R^2 = 0.7834, \; \overline{R}^2 = 0.7524,$$

$$\ln \hat{Y} = \underset{(4.47^{*})}{6.354630} + \underset{(0.81)}{0.816372} \cdot \ln X_1 + 0.088164 \cdot \ln X_2, \; R^2 = 0.9112, \; \overline{R}^2 = 0.8520,$$

The values of Wald statistics for Bačka F = 0.012946 (p = 0.9109), for Banat F = 0.589772 (p=0.4553) and Srem F = 0.342771 (p=0.5994) suggest that the null hypothesis on restrictions of parameters $\alpha + \beta = 1$ can be accepted and the homogeneous Cobb-Douglas model can be applied..

The influence of first variable (agricultural population) is determined by higher partial regression coefficient in Banat region than in Bačka and Srem regions. In the same time the degree of influence of second variable (investments in agriculture) is higher in Bačka region than in Banat and Srem regions.

The similar conclusions were obtained if the influence of the combination of active agricultural population (X_3) and investment in agriculture (X_2) on the achieved national income from agriculture, was considered.

The paper also considers the extended form of Cobb-Douglas function, which includes the arable areas, X_4, as well. The estimated extended model of Cobb-Douglas function in double logarithmic form for Vojvodina was:

$$\ln \hat{Y} = \underset{}{5.201357} + \underset{(4.40^{**})}{0.562476} \cdot \ln X_3 + \underset{(2.05^{*})}{0.292956} \cdot \ln X_4 + \underset{(4.27^{**})}{0.142536} \ln X_2 ,$$

$R^2 = 0.8340$, $\overline{R}^2 = 0.8205$. On the base of nonlinear model of Cobb-Douglas function

$$\hat{Y} = 181.518395 \cdot X_3^{0.562476} \cdot X_4^{0.292956} \cdot X_2^{0.142536}$$

it may be concluded that the highest contribution to the growth of national income had agricultural population and the investment in agriculture the least.

Conclusion

Based on the indicators of the level of development (corrected national income per capita) of Serbian municipalities in 2005, it was concluded that Vojvodina, as one of three regions in Serbia, can be included in developed regions.

Grouping districts according to the share of rural population in municipalities showed that rural and mixed regions are dominant in Vojvodina.

The share of national income from agriculture in the overall national income in 2005, analyzed for the districts of Vojvodina, is high and it ranges from 29 (%) to 48 (%). For example, the share is the highest in the middle Banat district (47.5%), while it is the lowest in the western Bačka district (28.9%). In all districts except Northern and and Wester Bačka in the period 1997-2005 the share of national income from agriculture in the overall national income decreased.

The paper examines the influence of the number of agricultural population, active agricultural population, investments and arable area on the national income from agriculture, both for Vojvodina as a whole, and for its separate regions: Bačka, Banat and Srem.

The model of Cobb-Douglas production function, formulated by American economist Paul Douglas and mathematician Charles Cobb in 1928, was employed in this paper. This is a simple model which can be used to successfully model the influence of labour and capital on the achieved production, as was also confirmed by this research. In all the instances, it was determined that the influence of the demographic factors is higher compared to the analyzed economic factors.

Acknowledgements

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RESILIENCE OF SOCIAL-ECOLOGICAL SYSTEMS IN EUROPEAN RURAL AREAS: THEORY AND PROSPECTS

Marleen Schouten[1], Martijn van der Heide[2], Wim Heijman[3]

Abstract

In today's world, rural areas are confronted with a spectrum of changes. These changes have multiple characters, varying from changes in ecosystem conditions to socio-economic impacts, such as food- and financial crises. They present serious problems to rural management and largely affect future perspectives of rural areas. Rural resilience refers to the capacity of a rural region to adapt to changing external circumstances in such a way that a satisfactory standard of living is maintained, while coping with its inherent ecological, economic and social vulnerability. Rural resilience describes how rural areas are affected by external shocks and how it influences system dynamics.

This paper further eradicates on this concept, by exploring in detail what the importance is of resilience theory within rural areas. An answer is tried to be given to the question how to detect resilience in rural areas, by reviewing the existing literature and to the question how to enhance resilient rural development. Finally questions are formulated for further research within the field of rural resilience.

Key words: Resilience; social-ecological systems; rural development; complex adaptive systems; system dynamics.

1. Introduction

Rural areas in the European Union occupy 90% of the territory and approximately 50% of its population. Agriculture and forestry are the main land types and play a key role in the management of natural resources in rural areas and in determining the rural landscape (EC, 2009). Rural areas have undergone and are undergoing major changes. These changes are partly the result of agricultural policies, but there are other driving forces, both ecological, spatial and sectoral, which affect rural areas. Different policies and trends have large environmental impact in terms of land use, landscape changes, environmental pollution and biodiversity loss, and large economic impact in terms of changing demographics, reduction in agricultural employment and diversification of the rural economy.

No agreement exists on how to define the European rural area. Different categorizations and classifications are used, mainly based on socio-economic criteria (EEA, 1999). The OECD defines rural areas in terms of population density. In this paper, rural areas are defined as predominantly rural (>50% of the population living in rural communities) and significantly rural (15%-50% of the population living in rural communities). This classification can

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be spatially referenced with a reasonable degree of accuracy throughout the EU (OECD, 2007).

The way EU's rural areas develop is plural. While some rural areas still struggle with agricultural restructuring and population decline, others have been more successful in re-organizing agricultural production, and further developed their agri-business. Some have also benefited from the re-location of enterprises and mostly retired people from the urban to the less congested rural areas (Sallard, 1998). EU's rural areas are also more and more confronted with the increased importance of non-agricultural sectors, e.g. industry and services. While agriculture is losing importance, at least every second job in predominantly rural areas is in the service sector. Urbanization pressure and abandonment of land has led to a decrease in the area of agricultural productive land by 5% over the past 20 years (EEA, 1999). Intensification, marginalization, specialization and concentration have resulted in an increasing spatial differentiation of rural areas in terms of economic, social and environmental outcomes. In the future, also climate change could further distort the impact of agricultural practices on rural areas. The growing seasons will be extended, the variability of the climate will increase, which will lead to severe changes in productivity and will all have their effects on the nature and shape of rural areas. The main characteristic of the changes mentioned above is their unpredictability. While being unpredictable, these changes present serious problems to rural management and largely affect future perspectives of rural areas. To cope with these versatile changes, rural areas have to develop a certain amount of resilience, which refers to the capacity of a system to absorb disturbances and re-organize while undergoing change so as to still remain essentially the same function, structure, identity and feedbacks (Walker et al., 2004). Being more resilient, a rural area can better cope with changes without immediately ending up in a negative cycle after a disturbance.

Heijman et al. (2007) introduced the concept of rural resilience. Rural resilience refers to the capacity of a rural region to adapt to changing external circumstances in such a way that a satisfactory standard of living is maintained, while coping with its inherent ecological, economic and social vulnerability. In analogy to urban resilience (Colding, 2007; CSIRO, 2007) the concept of rural resilience determines the degree to which a specific rural area is able to tolerate alteration before reorganizing around a new set of structures and processes. It describes how well a rural area can balance ecosystem, economic and social functions (Heijman et al., 2007). This paper further eradicates on this concept, by exploring in detail what the importance is of resilience theory within rural areas. An answer is tried to be given to the question how to detect resilience in rural areas, by reviewing the existing literature and to the question how to enhance resilient rural development. Finally questions will be formulated for further research within the field of rural resilience.

The structure of the paper is as follows. After the introduction, first an overview will be given of resilience theory, applied to rural areas in the European Union. The main disturbances which rural areas are faced with are discussed, as well as the adaptation strategies. In section 3 the rural system and its components will be discussed in dept. In section 4, a literature review is given of attempts to assess resilience and the importance of modeling for analyzing rural dynamics is discussed. In section 5 some policy recommendations are given for the enhancement of rural resilience. This paper is concluded by the formulation of questions for further research.

2. Resilience in rural social-ecological systems

2.1 Resilience theory

Since the introduction of the concept of resilience in 1973 by the ecologist Holling, the concept also emerged in literature on psychology, economics and sociology (Gardner et al., 2007). The application of resilience to the uncertainties and rapid changes of rural areas has been minimal. Heijman et al. (2007) introduced the concept of rural resilience. This concept is based on the idea that ecological, economic and social systems become increasingly entangled, and interactions between these systems are increasing in intensity and scale. A rural area may be considered as a social system interacting with and depending on an ecological substrate and whose survival depends, among others, on its interrelations with the system of natural resources. The environment and its natural resources are conditioned by the actions of the population. The rural area can therefore be termed as a social-ecological system (SES) (Ambrosio-Albala et al., 2008). They should be seen as overlapping components, together forming a holistic complex adaptive system. The adaptive capacity of a rural system is a central feature of resilience and refers to the ability of a system to adjust to changing internal demands and external circumstances (Carpenter et al., 2008). Highly adaptive systems not always enhance resilience. Highly adaptive systems can lead to a loss of resilience through an increase in adaptability in one place, that may lead to a loss of adaptability and thereby resilience in another place. Moreover, increasing adaptability to known shocks, may optimize the system for this regime of shocks, but makes the system less resilient to unknown shocks (Walker et al., 2006). Therefore the interactions between and within systems should always be taken into account.

Within the context of rural resilience, the importance of spatial scales is paramount, and arises from a reciprocal relationship. Processes on a local scale can have global impacts on a longer run, while global trends can have direct or indirect effects on a local level or the levels in between (Van Den Bergh et al., 1991). Loss of ecosystem resilience, for example by a decrease in biodiversity, can have large global climate effects. And environmental and socio-economic processes might have important different consequences on a regional scale. An area's specific environmental, economic and social structures determine the resilience of the area, or the adaptability to external environmental and socio-economic forces (Van Den Bergh et al., 1991).

2.2 Adaptation strategies

The rural area is subject to a spectrum of disturbances. (White et al., 1985) define a disturbance as 'any relatively discrete event in time that disrupts ecosystem, community, or population structure and changes resources, substrate availability or the physical environment'. A disturbance regime is defined in terms of scale, frequency, predictability and severity (White et al., 1985; Turner et al., 1998). Ecologists tend to focus on natural disturbances, like fire, floods, hurricanes, insect outbreaks etc. Within social-ecological systems, other types of disturbances need to be included such as abrupt changes in regulations and world market shifts (Janssen et al., 2005).

Disturbances in one system of resilience can affect the resilience in other systems. If a rural area would not be economically resilient, meaning that the area is vulnerable to economic shocks, such as a reduction in wealth, sudden rise in interest rates or increased unemployment, the population would gradually move away and vulnerability increases. Progressively smaller

shocks are needed to cause crisis in the rural system. Vulnerability is a core concept of resilience and it includes the attributes of persons or groups that enable them to cope with the impact of disturbances, like natural hazards or socio-economic crises (Janssen et al., 2006). If the ecological sources of a rural area would not be resilient, conditions for ecosystem services, landscape services and agriculture would deteriorate, and – again - the vulnerability of the rural area would increase. For example, the natural biodiversity in landscapes can exert a bio-control function in crops, and prevent pest outbreaks in crops. A rich variety of species, each with variable population densities, constitute a more reliable control system compared to a situation with one or two main predator species. In other words, functional diversity of the agents providing the landscape service natural pest control increases the resilience of the SES. Also social sources of resilience such as social capital (trust and networks, experiences for dealing with change) are essential for the capacity of social-ecological systems in rural areas to adapt to and shape change (Folke, 2006). These social sources of resilience will be further discussed in section 3.2.

3. The rural system and its components

3.1 Rural system components

Before going into dept into the assessment of resilience in rural areas, it is helpful to first get a grasp of the different components that together form the rural social-ecological system. According to Cumming (2005) system components can be thought of as the pieces of the system that interact in a dynamic way. These components include e.g. human actors of various kinds, particular ecosystem types or habitat types, resources, goods and materials, and abiotic variables. System components interact or fit together. Examples of relationships are nutrient cycles, food webs, economic and ecological competition, land tenure, and interactions between human actors.

To be able to analyze the rural area as a complex social-ecological system, the system should be divided into simple units. Figure 1 shows the different components and their main relationships in a schematic way.

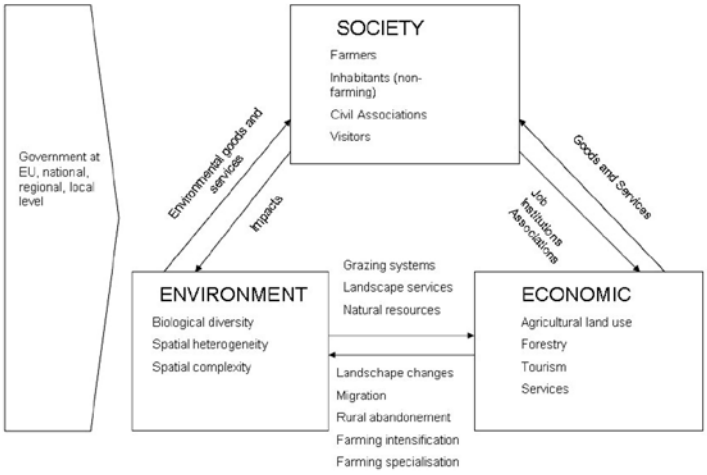

Figure 1 - Components of the rural social-ecological system and the involved stakeholders. The boxes represent the components, the arrows the interactions between these. From Rescia et al. (2008) (modified).

Four rural subsystems can be identified as key to understand the functioning of the system, namely:

1. Economic
2. Society
3. Environment
4. Government

The boxes represent the different system components, and the arrows represent the interactions between them. In this schematic overview of the rural SES, the government is treated as being externally influencing the system components and the interactions between these components. The governmental component will be discussed in more detail in section 3.3.

3.2 Rural actors, social networks and rural identity

A basic distinction is made between rural stakeholders that are farmers, non-farming inhabitants and visitors. These stakeholders all weigh economic, social and environmental outcomes in a different way. For the inhabitants, the economic dependency on the area can differ from weak to strong, based on their dependency on e.g. the agricultural or tourist sector. Changes in the landscape, for example, can have different economic and social outcomes for inhabitants. Traditions, rural identity and the community sense can play a large role in this development. In this way, disturbances that would jeopardize the landscape can affect farmers, but can also have large impacts on the local non-farming community. That is, exploring economic activities in an area, can lead to important social changes. Social outcomes are less important to visitors. They are basically interested in what the environment has to offer them. They demand a certain natural environment, and this can sometimes be conflicting with other activities.

'Hard' factors, like natural and human resources, investments, infrastructure and business development are traditionally seen as the main determinants for rural development policies. However, there is an increased recognition that also less tangible or 'soft' factors are important. These include for example social capital, social cohesion and local knowledge, which all contribute to rural development and increased rural cohesion. Social capital also determines to a certain extend the adaptability of a rural SES, and thereby enhances its resilience. There are three main determinants of social capital: leadership, social networks and trust. Leadership must be part of the dynamic process, and should include responsiveness to changing socio-economic and natural conditions. Co-operation and motivation within a social network depends strongly on the structure of the network, and thereby determines the adaptive capacity of the network. A lack of trust within the social network leads to inefficient information flows and deteriorates the social structure and thereby the system's resilience (Callaghan et al., 2008).

Figure 1 shows that the governmental system component is treated as being an external component influencing the SES, because of its multi-level character. Policies can have a far-reaching effect on rural areas and rural municipalities. There is a great variety of areas and instruments for rural area policies of which two broad categories can be distinguished: Policies directed to the agricultural sector, and rural development policies, which take into account a multi-sectoral approach from a regional development perspective. Structural changes in sector-based agricultural policies directed towards markets have been analyzed in many studies. Though, the impact of rural development policies is more difficult to grasp, and evaluation studies are rare. The impact of policy measures on rural areas depends strongly on

the dynamics generated by other factors, such as interest rates, job opportunities etc. (Happe et al., 2008). More on rural development policies in section 5.

4. Assessing resilience in rural social-ecological systems

4.1 Pitfalls for operationalisation

Having gained insight in the different components that together form the rural dynamic system, it is interesting to assess the resilience of such systems, eventually ending up with desirable characteristics of rural areas and their communities. However, assessing the resilience of social-ecological systems in general is challenging. Lots of pitfalls appear when operationalizing resilience in social-ecological systems. Should the operationalisation approach be theory or data driven? What kind of measures should be used to be of relevance for policy decision making? How many variables should be used to describe a rural social-ecological system? Walker et al. (2006) state that although social-ecological systems are self-organized through a large number of abiotic and biotic variables, the most important changes can be understood by using a small amount of variables. These key variables operate at different scales, with slower and faster rates in time and space. Because these variables influence the overall dynamics of the system, they are of direct interest to system managers. System managers tend to focus on fast variables. However, in ecosystems, the variables that control shifts and adaptability to changes, such as soil, sediment and long-lived organisms, tend to change slowly. From the propositions stated in Walker et al. (2006) can be concluded that ecological system components have slowly changing variables, whereas socio-economic components mainly have fast changing characteristics.

4.2 Review of resilience assessments in social-ecological systems

Given the various pitfalls, different attempts have been done in literature to assess or measure resilience in SES's in various analytical contexts. Most methodologies are applied to limited geographical and time scales and quantitative approaches have been largely based on valuation (UNESCAP, 2008). In ecological literature, especially the insect outbreak systems of spruce budworm (Ludwig et al., 1978) and fishing in lake-rich landscapes (Carpenter et al., 2004) are famous for their well defined systems and focus on system dynamics. These case studies use simple mathematical models that allow for an analysis of the long-run behavior of these systems, while looking at the possible attractors and the states in which the system can be. Also case studies with a social background exist in which social processes are included in the system dynamics, and in which multiple resources are involved (Gunderson et al., 2006; Berkes et al., 1992). The variety of frameworks that exist for the study of SES's often lack a clear description of the structural changes and a comprehensive analysis of the system dynamics, which are key aspects for resilience theory. As Folke et al. (2002) argue, resilience measures for SES's should focus on the variables that underlie the capacity of environmental systems to provide ecological services to socio-economic systems.
All resilience assessments in SESs are constrained by complexity and the availability of data. There are two main approaches for assessing resilience that are used the most in literature. That are 1) the development of a resilience index to compare resilience at a macro level, between countries or regions 2) case study or series of case studies to assess resilience. In Table 1, a review of approaches to assess resilience is summarized.

Table 1 - Approaches to assess resilience in social-ecological system

Author	Discipline	Assessment objective	Methodology	Result
Case study approach				
Rose, A (2005) Modeling regional economic resilience to disasters: a computable general equilibrium analysis of water service disruptions	Economics	To advance a CGE analysis for application to estimating the regional economic impacts of earthquakes and other disasters	Develop methodology for recalibrating CGE model parameters with empirical estimates of production losses due to a lifeline supply disruption.	Application of the model showed how indirect economic losses vary according to the overall level and sectoral mix of water shortages, the extent of pre-event mitigation and post event inherent and adaptive resilience
Bruneau, M., S. E. Chang, R.T. Eguchi, G.C. Lee, T.D. O'Rourke, A.M. Reinhorn, M. Shinozuka, K. Tierney, W.A. Wallace, D. Von Winterfeldt (2003) A Framework to quantitatively assess and enhance the seismic resilience of communities	Ecology	To define seismic resilience of communities and quantitative measures of resilience that can be useful for a coordinated research effort focusing on enhancing this resilience	Framework relying upon complementary measures of resilience and includes quantitative measures for robustness and rapidity, resourcefulness and redundancy, together integrated into four dimensions of community resilience.	The framework can be used for comprehensive characterization of the earthquake problem to establish needs and priorities. The contribution of various activities to seismic resilience can be evaluated.
Ives, A. (1995). Measuring Resilience in Stochastic Systems", in Ecological Monographs 65 (2) 1995, pp. 217-233. Ecological Society of America	Ecology	To measure resilience in a stochastic ecological system	Deterministic resilience= return time to equilibrium. Stochastic resilience= ratio of variability in population densities to variability in population growth rates, calculated from community matrix describing the average interaction strengths within and among species	Simple methodology that can be applied to a wider range of ecological communities
Tierney, K., Bruneau, M (2007) Conceptualizing and Measuring Resilience: a key to disaster loss reduction, TR News, June 2007	Ecology and Sociology	To define disaster resilience, and to develop measures appropriate for assessing resilience and de monstrate the utility of the concept through empirical research	Development of the R4 framework of resilience including four components robustness, redundancy, resourcefulness, and rapidity.	The framework suggests a range of approaches to enhance resilience, and to develop a robust organizational and community capacity to respond to disasters.
Elbourne, A., D. Laeser, B. Smid and M. Vromans, 2008, Macroeconomic resilience in a DSGE model, CPB Discussion Paper.	Economics	To use the dynamic stochastic general equilibrium (DSGE) model to analyze the resilience of an economy in the face of external shocks	Relevant measure for resilience is the level of expected discounted utility. Combining micro founded structural approach with empirical models, taking into account the effects of labour market, goods market and capital market inflexibilities in response to supply and demand shocks	Effect of market rigidities (price stickiness, wages) on the expected level of utility is minimal. Especially when comparing to the effect of market competition, while having a direct effect on output.

Author	Discipline	Assessment objective	Methodology	Result
Case study approach				
Cumming, G.S., G. Barnes, S. Perz, M. Schmink, K.E. Sieving, J. Southworth, M. Binford, R.D. Holt, C. Stickler, T. Van Holt (2005) An Explanatory framework for the empirical measurement of resilience	Ecology	To present an exploratory framework for the operationalization of resilience for empirical studies	A surrogate measure for resilience is developed with the use of the surrogate system identity. Key components for system identity like innovation and memory are used to obtain a set of specific focal variables	The concept system identity provides a level of generality that can be used to compare measure of resilience across cases.
Bennet, E.M., G.S. Cumming, G.D. Peterson (2005) A Systems model approach to determining resilience surrogates for case studies	Ecology	To define a method in which simple systems models are used as a framework to identify resilience surrogates for case studies	Development of a four-step process of identifying resilience surrogates through development of systems models	The construction and analysis of simple systems models provides a useful basis for guiding and directing the selection of surrogate variables that will offer appropriate empirical measures of resilience
Loucks, Daniel and John Gladwell (eds.) Sustainability Criteria for Water Resource Systems. Cambridge University Press (1999)	Ecology	To measure resilience and assess comparative resilience of multiple scenarios	Resilience is accessed by dividing the number of times a satisfactory performance value follows an unsatisfactory performance value by the total number of unsatisfactory values	Resilience along with reliability and vulnerability help in selecting the most sustainable alternative. Simple methodology that can be applied to multiple alternatives
Macro level comparative analysis				
Brenkert, A.L., E.L. Malone (2005) Modeling Vulnerability and resilience to climate change: a case study of India and Indian States	Economics and Ecology	To apply an indicator-based modeling approach using a Vulnerability-Resilience Indicator Prototype to assess the vulnerability of Indian states to climate change	Six criteria used to design a methodology for vulnerability assessment, based on these criteria, 17 coping, adaptive capacity and sensitivity indicators are calculated and an overall indicator of vulnerability is aggregated.	Robust modeling framework allows analysts and stakeholders to systematically evaluate vulnerability and resilience at sub-national level
L. Briguglio, G., S. Concordina, S. Bugeja, N. Farrugia (undated) Conceptualizing and Measuring Economic Resilience, Economics Department, University of Malta	Economics	To develop a conceptual framework for the analysis and measurement of economic resilience between countries	Resilience index is based on an average of four components, value varying from 0-1	Positive relation of economic resilience with GDP per capita, and negative relation with economic vulnerability. Per capita GDP is found to be more sensitive to resilience than to vulnerability.

When looking at the macro level comparative analysis, two studies, namely Brenkert et al. (2005) and Briguglio et al. (2005), attempt to provide an indication of the relative subsystem resilience, be it social, ecological or economic. The construction of a unified resilience index for integrated social-ecological systems is challenging. Developing such a system would fill an important gap left by the available indicators. So far, shocks are considered in each subsystem, while in fact shocks are transmitted across the subsystems, thereby affecting each subsystem. Maybe a conceptual basis should be developed for the selection and weighting of indicators that measure the resilience of each subsystem and to combine them in order to capture the adaptive capacity of the integrative system. One should wonder what the value-added of such an index could be, for example for policy analysis.

When looking at the articles under the case study approach also mainly attempt to provide an indication of a relative subsystem of resilience have been explored. Two articles, namely Rose (2005) and Elbourne et al. (2008), focus on economic resilience, by using general equilibrium models. Two articles, namely Cumming et al. (2005) and Bennet et al. (2005), focus on surrogate variables, mainly in ecological case studies, that could be appropriate empirical measures for resilience. From the table can be concluded that there is a surge of scholars studying and managing ecosystems and social systems as one, social-ecological system. First, there should be an understanding of the processes within social-ecological systems, before there could be focused on the management for social-ecological resilience and ultimately on the assessment of resilience within these systems. By applying resilience theory to empirical case studies, the current state of a social-ecological system can be assessed, and predictions can be made about whether or not the properties of interest are resilient. This assessment can be used by policy makers to 1) identify their actions as being (non) resilient, and (2) to identify strategies that focus on enhancing or reducing particular priorities, such as human health or invasive species, as system disturbances occur (Cumming et al., 2005).

4.3 Modeling rural dynamics

As stated in the previous section, it is of vital importance to first get a full understanding of the processes within SES's, before one could focus on the assessment of resilience of these systems. Especially in rural areas, where these processes have a highly interactive and dynamic character, these understandings are essential. The use of simulation models have been proven an adequate method to represent a real life system including the complex interactions that it exhibits. To model a social-ecological system, all three social, economic and ecological components must be taken together to fully understand the system dynamics (Berkes, 2003). In this current paper, rural areas are seen as open systems operating far from equilibrium, with material, energy and information flowing both into and out of them. It is the way in which their internal socio-economic and ecological components are organized, that determines how the flows are used and traded. In this system, humans should be seen as an integral part of the rural area. In many models, humans are seen as external drivers on ecosystems or as users of the environment, but not influencing it.

There are several ways to construct these simulation models. One is systematic experimentation, which would be less effective in this case. The reason for this is that studying human behavior in complex environmental settings is difficult to realize because the effects of interventions may depend strongly on the context in which they are implemented. Rather, a methodology is needed that allows for experimenting with behavioral processes within different actors, with social processes between actors and with interactions between actors and the environment. Agent-based simulation offers a perspective on simulating human behavior in complex

environments, and thus may provide a suitable tool to experiment with the management of complex environmental resources. Agent-based modeling is a rapidly emerging modeling technique to incorporate more realism into models, while not focusing purely on economic rational behavior. It originates from the field of artificial intelligence, and consists of a number of 'agents' representing decision-making entities, which interact both with each other and with their environment. These agents can make decisions and change their actions as a result of this interaction (Grimm et al., 2005). Within the model, agents have their own interpretation of their environment, build up from experiences with the interactions with their environment. The behavior of the whole system depends on the aggregated behaviors of the individual agents. Social interactions, adaptation and multiple scales of decision making are taken into account. These models offer a way of exploring the impact of links between agents within the system.

Woolridge et al. (1995) identify three basic properties in an agent-based model (ABM). These are reactivity, which is the ability to respond to events in the environment; pro-activity, the ability to demonstrate some behavior determined by its particular objectives, taking the initiative to satisfy its necessities; and sociability; the ability to interact with other agents or humans to fulfill its objectives. These properties give agent-based systems a great versatility in comparison with other approaches by providing a new type of representation of the problem domains. ABMs are therefore also very suitable for analyzing resilience within rural areas because the dynamic, non-linear behavior of agents within the rural area can be simulated as well as their reaction to unknown shocks.

5. Towards resilient rural policy development

A stated in section 3.3, the role of governmental policies is of paramount importance to the adaptability and thereby to the resilience of rural SES's. Understanding how these policies drive change, and the channels and actors through which they get effective in rural areas is fundamental to the design of effective policies in rural areas (Happe et al., 2008). Policies can have various characteristics, from having an accelerating nature, to a way to slow down certain developments. This will be illustrated with the following example. In the past, agricultural support policies have led to an increase in production while encouraging the maintenance of marginal farms. Market price support systems lead to higher returns on products, which was transferred to higher input prices for production factors. High prices encouraged the expansion of production, beyond market demand while using capital-intensive production methods (OECD, 1994). Guaranteed prices reduced uncertainties and therefore reduced the incentive for farms to diversify and spread production risk. A decrease in agricultural sector resilience was the result.

Since the variation among rural areas is great, policies need to be addressed and tailored to the situation in a specific rural context involving all actors shaping rural areas. What specific policy measurements could enhance resilience in rural areas? In 2005, Janssen and Osnas defined characteristics that make SES's resilient. These characteristics can be used by policy makers while designing rural development policies. The three characteristics that make a system more resilient are redundancy, modularity and diversity in agents and interactions (Janssen et al., 2005). Redundancy enables a system to maintain its function when a component is lost, and the redundant component takes over the function. An example of redundancy in institutions is informal and formal rules of resource management. Low et al. (2003) gives a good example with Lobster fisheries in Maine. They have developed a comprehensive set of rules to govern their use of resources, next to the existence of formal

state and federal regulations on lobster fisheries. Modularity is a second key factor for system resilience (Low et al., 2003). With modularity a system is meant that has different functional parts or modules that can evolve somewhat independently. The modules are loosely linked to each other, but not depending on each other. Within social sciences, this is known as polycentricism. A third general factor for resilience is diversity in agents or interactions. In complex adaptive systems, such as rural areas, different components can become specialized in different tasks. In systems with low diversity, there is less chance of creating new ideas, components or connections (Janssen et al., 2005).

From these three system characteristics that enhance resilience policy recommendations can be extracted. When designing policies, there is a trade-off between specialized adaptation, meaning policies that are specialized in stimulating or preventing a certain development of one component, but this also decreases the resilience of the system, because it is more vulnerable to new types of disturbances. A high diversity of policies that cover a large part of the system is needed to create more resilient rural SES. A good example is taken from Hackl et al. (2007). In this article local compensation payments made to farmers are analyzed for providing landscape amenities in Austrian Alpine tourist communities. The payments the farmers receive are the result of a bargaining process at the municipal council level. The benefits gained by these services are important for all three components of the rural SES discussed in section 3 and thereby increasing the resilience of the whole rural SES.

6. Conclusions

In this paper, the idea is put forward that rural areas are dynamic socio-ecological systems, made up of social, economic and ecological components interacting together. These systems are exposed to sudden shifts in rural dynamics, and these changes present serious problems to rural management. After the introduction by Heijman et al. (2007) this paper further eradicates on the principle of rural resilience, and thereby proposing adaptation strategies and policy recommendations to build and enhance resilience in rural systems. The question is challenged how to measure resilience and thereby including its system dynamism through focusing on the interactions between the three main system components. Through the use of a literature review, attempts are analyzed to assess resilience in SES. Based on the results discussed in this paper, the following research questions can be raised. How can the resilience of dynamic rural social-ecological systems be assessed and what measures can reinforce the interactions between the three components underlying a social-ecological system in a rural area, in order to maintain a certain desirable system state? How can rural development policies be analyzed, based on their contribution to a resilient SES? What is needed in terms of policy measures, to enhance the resilience of rural SES? To address these questions, further research is needed on the processes occurring in rural system to learn to understand how they interact together to contribute to overall system dynamics. Given the literature overview in Table 1, scholars did not succeed yet in simulating dynamics in a SES in a practical way. Modeling plays a central role in this process. Especially agent-based modeling is a promising technique that asks for further research.

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THE INFLUENCES OF EXPORT CONTROLS ON WHEAT MARKETS IN SERBIA DURING THE FOOD CRISIS 2007-2008

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Abstract

During the food crisis in 2007/2008 the government of Serbia restricted the export of wheat to ensure that wheat supply on the domestic market is sufficient thereby dampening the increase in consumer food prices.

This study investigates the effects of the export restriction on the integration, equilibrium and stability of its domestic wheat market. Within the framework of a Markov-switching error correction model, we utilize weekly wheat grower prices of Serbia and world market prices and compare the state of the wheat market prevailing in the time period before the crisis to when the exports controls are effective.

Our results suggest that although the degree of market integration and thus the long-run price elasticity do not change during the crisis, the market equilibrium was disrupted and the stability was reduced during the crisis. Also, we find that the price dampening effect of the export restrictions prevailed only in a short time period and that the Serbian wheat grower prices even increased beyond the world market afterwards.

Key words: wheat market, international market integration, price transmission, Markov-switching vector error correction model

1. Introduction

World market prices for agricultural raw products have risen dramatically during the past years leading to the global food crises. For example, for wheat the world market price (FOB Rouen-France) increased by 313% from January 2006 to January 2008.

Several studies have analyzed the causes of food crises e.g. PIESSE and THIRTLE (2009), MEYERS and MAYER (2008), VON BRAUN et al. (2008) and HEADEY and FAN (2008) identifying several factors. First of all rising energy prices had a strong impact on the costs of agricultural production and trade. Also, wheat production in some of the major wheat exporter countries, such as USA, Australia and Ukraine, was particularly low due to unfavorable weather conditions. Also, the intensive development of biofuel industry due to its subsidization in many industrial countries fostered the increasing utilization of cereals for non-food purposes.

Many governments have responded to the global rise in food prices by political interventions on their markets. About 101 governments worldwide implemented some policy measures between mid-2007 to mid-December 2008 to dampen price increase on domestic markets (FAO, 2008). A wide variety of different short-run policy measures were implemented as

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e.g. the reduction of import tariffs and taxes, domestic price control, export taxes and export restrictions (GRUENINGER and VON CRAMON, 2008).

Serbia is one of the European countries which implemented policy measures to reduce the impact of soaring world market prices on domestic prices. This paper is unique in investigating the effects of these trade policy measures on the domestic markets. In particular, we analyze how export controls have affected the integration, equilibrium and stability of Serbia's domestic wheat market. We utilize a Markov-switching vector error correction model analyzing how the state of Serbia's wheat market altered during the time period when export restrictions prevailed compared to the time period before the crisis.

The paper is organized as follows. Section 2 describes agricultural trade policy in Serbia. Section 3 describes Serbia's wheat export policy during the food crisis 2007-2008. Section 4 describes the methodology and data, and Section 5 presents the results of empirical analysis. Section 6 discusses the results and provides conclusions.

2. Serbia's Wheat Trade Policy

Serbia's agricultural sector is characterized by high soil quality, favorable climate, and a good strategic trading location. After planned agricultural production during communist era, producers are now confronted with more open markets facing international competition. Agriculture's share of GDP is falling steadily (as expected in a transition economy), yet the sector remains the country's largest export earner and largest employer.

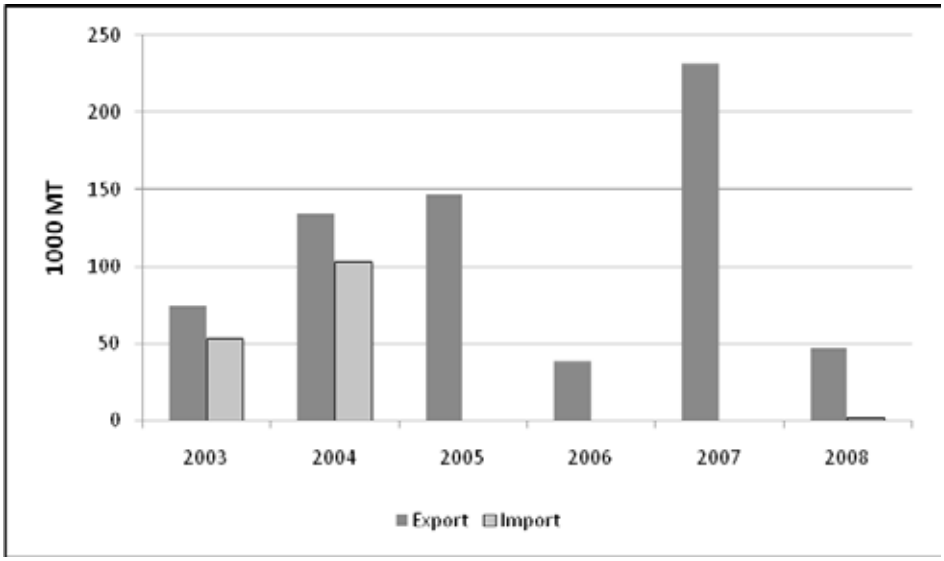
The export of agricultural raw products is steadily increasing during the last years with cereals representing one of the most important export products. Total grain export amounted about 172 million US$ in 2008, accounting for 24% of total agricultural exports. The main commodities corn and wheat represent 79% and 12% of total grain export in 2008, respectively.

In general, Serbia is a net exporter of wheat (Figure 1). Though, in the year 2003 the harvest was extremely low, and thus Serbia needed to import about 100,000 t of wheat in 2003 and 2004 in order to stabilize the market.

Serbia's wheat production is not competitive regarding quality and price with major export countries in the region such as Hungary and Ukraine, but it is very competitive in countries of former Yugoslavia such as the FYR Macedonia, Bosnia and Herzegovina and Montenegro (WORLD BANK, 2006). These countries have huge structural cereal deficits and they prefer Serbia as trading partner due to low trade costs and good political relations. Therefore, CEFTA[2] members are Serbia's main trading partners.

2 The **Central European Free Trade Agreement (CEFTA)** is a trade agreement between Non-EU countries in Central and South-Eastern Europe. As of 1 May 2007, the parties of the CEFTA agreement are: Albania, Bosnia and Herzegovina, Croatia, Macedonia, Moldova, Montenegro and Serbia with Kosovo.

Figure 1 - Serbian wheat export and import, 2003-2008



Source: Statistical office Serbia

In the course of Serbia's trade liberalization, the maximum import tariff for agricultural products has been reduced from 40% to 30% in 2003 (WORLD BANK, 2003). Though, the import tariff on wheat remained very high at the level of 30%. Also, export licenses were imposed from June 28, 2003 until November 27, 2004. During this period trading companies were obliged to submit an official export or import request to the Serbian government. Quantitative export controls for wheat and corn among several other agricultural commodities were again imposed on August 4, 2007 lasting until June 15, 2008.

3. Policy Measures and Trade Regime regarding Wheat during the Food Crisis 2007/2008

On August 4, 2007 the Serbian government imposed quantitative export controls[3] on wheat and corn, in order to prevent exports from Serbia and to secure supply for domestic consumption. Although the Ministry of Agriculture, Forestry and Water Management (MAFWM) announced the introduction of export quotas for wheat, export quotas were actually not issued, thus the export was completely restricted (USDA GAIN REPORT, 2007).

The export restriction was first announced to last for 3 months until December 2007, but on October 26, 2007 the government notified the extension of the export restrictions until June 15, 2008, and export quotas of the size of 80,000 t of wheat flour were issued.

The main reason for implementing trade restrictions was securing sufficient wheat supply for domestic consumption. Serbian wheat production was declining in 2006 and 2007. Wheat production in 2007 was almost at the same level as in the previous year amounting about 1,900,000

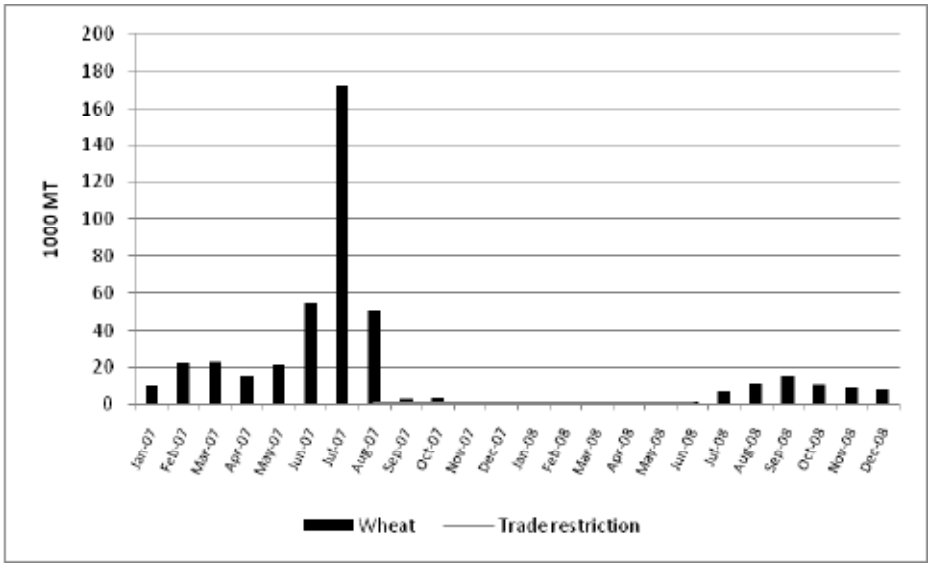
3 Serbian official Gazette No. 73/07, 97/07 and 126/07

t with average yields of 3.3 t per ha (Statistical office of Serbia). Also, total domestic consumption was of the size similar to the previous year amounting 1,750,000 t (MAFWM, Serbia). Therefore, concerns about securing sufficient wheat supply for domestic consumption was not induced by low production but rather by the dramatic increase in Serbian wheat exports in the first half of 2007. In particular, from January to July 2007, Serbia's wheat exports amounted 232,179 t, corresponding to an increase by 504 % when compared to 2006 (Figure 2). The main export destinations were the EU (Germany, Cyprus, Austria, Slovenia and Romania) with 68.77% of the wheat exports[4], and Bosnia and Herzegovina (17.12%).

Another reason for the high demand for Serbian wheat in this time period was the relatively low price of Serbian wheat compared to the world market price. In the first half of 2007 the Serbian wheat price was either lower than or at most as high as the world market price so that Serbian wheat was very competitive which increased foreign demand (Figure 3).

Significant regional demand and growing prices on the world market dramatically influenced the relatively small Serbian wheat market. For example, to secure their own stocks, domestic wheat demand by mils and huge industrial companies increased substantially in September and October 2007. This implied that the wheat price increased to 358 US$ in December 2007 (Figure 3).

Figure 2 - Monthly wheat export, 2007-2008



Source: The Global Trade Atlas

4 In 2007 EU had significant loses in wheat which caused increase in imports of 35% comparing to previous year (2006).

Figure 3 - Weekly wheat silos prices 2005-2008

Source: Yugoslavian Grain Fund

In the aftermath of the government's announcement that trade restrictions will be extended until June 2008, wheat prices stabilized for few weeks on a very high level. The stabilization of wheat prices was also supported by the governmental announcement of the buy-out of about 60,000 t of wheat from Serbian producers in September 2007 in order to ensure enough wheat stocks.

At the beginning of 2008, Serbian wheat prices continued to increase up to 452 US $/t in April while at the same time the wheat world market price was 369 US $/t. This induced the government to abolish the wheat import tariff of 30% within an import quota of 200,000 t. In light of a good wheat harvest in 2008 and the stabilization of the wheat market, the Serbian government abolished the export controls on June 15, 2008.

The influence of the above described wheat trade policy measures during the food crisis 2007/2008 on the state of the Serbian wheat market, i.e. equilibrium, stability and international integration is analyzed in the next section.

4. Impact of the food crisis policy measures on Serbia's wheat market

4.1 Method and data

According to the (weak) Law of One Price, two spatially separated markets are in their equilibrium if the difference between the prices of these two markets equals at most the size of the costs of trade between these two markets. Exogenous shocks, e.g. a decreasing supply due to bad weather, might lead to a temporary disequilibrium, but if the markets are efficient, then arbitrage activities (e.g. trade) of market participants imply that the prices are driven back to their equilibrium level and thus that the market equilibrium is restored (FACKLER and GOODWIN, 2001). For example, suppose that the wheat grower price in Serbia is increasing beyond the world market price level, traders may make a profit by selling wheat from the world market on the Serbian wheat market. Then, wheat supply increases, implying that prices on the Serbian market decrease at most to their equilibrium level which is equal to the world market price plus the costs of transporting and selling wheat bought on the world market on the Serbian market. However, if trade is restricted,

then arbitrage is incomplete or even impossible leading to market disequilibrium. This implies that price changes on one market are incompletely or not at all transmitted from one to the other market thereby decreasing the degree of market integration. If markets are separated or integrated only to a low degree, then the stability of the market price may decrease because price differences are not or only to a limited extend equalized by arbitrage activities.

In this study we investigate the effects of the export restriction on the state of the domestic wheat markets within the framework of a Markov-switching vector error correction model (MSVECM) tracing back to HAMILTON (1989). A MSVECM was first designed by KROLZIG et al. (2002) to analyze business cycles and was recently introduced in the analysis of price transmission by BRÜMMER et al. (2009). In contrast to a linear vector error correction model (VECM), which is a time-series model adequate to analyze a market in a time period when the market prevails in one particular state which is characterized by one price transmission regime, a MSVECM can be applied even when the state of the market changes and several price transmission regimes prevail in the market. In our case we hypothesize that the state of the Serbian wheat market changes due to the restriction of exports and imports and several price transmission regimes might be observed during the time period underlying this analysis.

A further advantage of the MSVECM is that it allows distinguishing different price transmission regimes even if the state variable, which governs the regime switches, can not or only incompletely be observed. The state variable determines the probability with which a particular regime prevails in the market at a given point of time. The MSVECM is based on the assumption that the data generating process underlying the state variable is following a Markov-chain. This implies that the state of the market of tomorrow is determined only by the state of the market of today but not of yesterday.

The parameters of a MSVECM are estimated by maximizing the likelihood function with the expectation maximization algorithm (KROLZIG, 1997). Based on starting values for the parameters to be estimated, the parameters characterizing the unobserved state variable and the probability of a change of one regime to another regime (transition probability) are first estimated. In the next step, the starting values are updated based on the parameters estimated in the first step within an iterative procedure. This procedure is stopped when the parameter estimates of two consecutive estimations do not differ significantly.

We conduct our analysis based on 190 observations of the weekly wheat grower price of Serbia (obtained from Yugoslavian Grain Fund) as a measure for the wheat price of Serbia and the port F.O.B. price of wheat ("Other wheat's") of Rouen (France) as a measure for the world market price (Figure 3). The time period underlying our analysis last from January 2005 until October 2008.

4.2 Results

The results of the ADF test and the KPSS test suggest that both data series are integrated of order 1. Further, Johansen's test on cointegration finds that the Serbian wheat grower price and the wheat world market price are co integrated, which can be interpreted economically that a long-run equilibrium between these two markets exists and that the Serbian wheat market and the world wheat market are integrated. Thus, the preconditions for utilizing an error correction model are given.

The results of the τ-Test of HANSEN and JOHANSEN (1999) suggest that the long-run equilibrium relationship is stable throughout the whole time period underlying our analysis. This justifies estimating the MSVECM within a restricted framework. This means that the long-run

equilibrium relationship (cointegration vector) is estimated separately in the first step. Next we retrieve the error correction term from this long-run equilibrium relationship which enters the MSVECM as a variable. In the second step the MSVECM is estimated in an iterative procedure. The final specification of the model is selected by several model selection criteria (AIC, HQ and SC). Table 1 presents selected parameter estimates[5] for a MSVECM specification with 3 regimes and 2 lags included in the model. The model diagnostics indicate that no autocorrelation, homoscedasticity and normality of the residuals are given.

Table 1 - Selected parameter estimates of the MS (3) – VECM (2)

Market	**Indicator**	**Normal Export 01/05-05/08 (Pre-crisis)**	**Export Restriction 08/ 07-06/08 (Crisis)**
Prices	Avg. world market price	164	368
	Avg. producer price	154	363
	Producer price in % wmp*	95%	99%
Long-run price transmission	Elasticity	0.978	0.978
	Constant	0.01	0.01
Equilibrium	**General**		**Disrupted**
Deviation from equilibrium	Avg. |ECT|	0.102	0.170
Adjust. dynamics	Speed of adjustment**	-0.09	-0.07
Stability	**General**		**Reduced**
Price fluctuation	Residual standard error**	0.016	0.025

* wmp = world market price

** regarding the most probable price transmission regime prevailing in this time period

5. Discussion

Table 1 shows the wheat world market prices and the Serbian producer prices which more than doubled during the food crisis. In the time period before the food crisis, the producer price was mostly below the world market price amounting on average 95% of the world market price. Though, during the food crisis, when export restrictions were effective, the difference of the wheat grower price to the world market price first increased but decreased thereafter. Finally, the producer price even increased beyond the world market price (Figure 1). Therefore, the Serbian wheat producer price amounted about 99% of the world market price on average during the food crisis.

Our model results suggest that the long-run equilibrium and thus the degree of market integration remained constant throughout the whole time period underlying our analysis, characterized by an elasticity of 0.978 and intercept value of 0.01. Though, the deviations from the long-run equilibrium increased during the crisis, corresponding to the increase in the average absolute value of the error

5 Complete results are available from the authors upon request.

correction term (ECT) by 67% from 0.102 to 0.170. Since the speed of adjustment decreased by 22% during the crisis, the time period within which deviations from the long-run equilibrium were corrected increased. This might result from the export restrictions which inhibit arbitrage activities which restore the long-run equilibrium if the prices are temporarily in disequilibrium.

The increase of the residual standard error by almost 60% during the food crisis indicates that the stability of the market increased significantly.

In contrast to our expectations, and different to the experience with export restrictions in Russia and the Ukraine during the food crisis 2007/2008, the export controls in Serbia did not achieve that the grower price increased at a slower degree than the world market prices. In contrast, the wheat grower price of Serbia even increased beyond the world market price in the time period January 2008 to June 2008. This development might have been caused by extremely high fuel and fertilizer prices prevailing during the wheat sowing period lasting from October to November 2007. This implied that a lot of farmers could not afford to buy the required fertilizer, and since farmers had difficulties to get credits due to the financial crisis, less wheat area than in the previous year was sown. Total wheat harvest area in 2007 was 463.000 ha which is the lowest area harvested since the Second World War. Therefore, analysts expected a wheat supply shortage in Serbia prevailing even after the harvest in fall 2008. Wheat prices in Serbia even increased beyond the world market price, since high import taxes prevented wheat imports from the world market. Although the Serbian wheat producer price was extremely high, some traders even didn't sell their wheat but kept it stored hoping that prices would increase even more. During this time period of extremely high prices, the Serbian market was very thin and only small quantities of wheat were traded. According to experts' information, only a few wheat processing companies who ran out of stocks bought at these high prices, whereas most companies utilized the wheat kept in their stocks. This implied that the government maintained the export controls although other countries as Ukraine and Russia had removed their export restrictions in March 2008 in light of the expectation of a "bomber" harvest. Due to excellent weather conditions, the wheat harvest turned out to be above average even in Serbia and the export controls were removed in June 2008 implying that the wheat producer price started to decrease at a level which is lower than the world market price.

6. Conclusions

This analysis has shed light on the effects of the restriction of wheat exports during the food crisis in Serbia. Our results suggest that although the degree of market integration and thus the long-run price elasticity do not change during the crisis, the market equilibrium was disrupted and the stability was reduced during the crisis. Also, we find that the price dampening effect of the export restrictions prevailed only in a short time period and that the Serbian wheat grower prices even increased beyond the world market afterwards.

In future research, the causes which have led to the increase in the Serbian wheat grower price beyond the world market price have to be investigated within interviews with market participants more comprehensively. Also, based on a comparison of the costs and benefits of alternative policy measures policy options should be designed which would allow the Serbian government to respond to increasing world market prices in the future more efficiently.

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SMALL AND MEDIUM SIZE ENTERPRISES AS SUPPORT TO DEVELOPMENT OF AGRIBUSINESS OF REPUBLIC OF SERBIA[1]

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Abstract

Development of strong and competitive sector of small and medium enterprises has very important role in process of total transition in Republic of Serbia. This sector should be one of the guidelines of economical development in the future, like in developed countries. Within the ″Strategy of development of SME and entrepreneurship in Republic of Serbia from 2003 to 2008″ government of the Republic of Serbia, not accidentally, placed, among many other sectors (which are expected to contribute and boost economical development, increase the employment rate, and realize increased foreign export earnings), the sector of agricultural products processing. It can be concluded that significant contribution from agriculture to improvement of overall economic status is expected. Accession to EU should be considered not only as the opportunity, but also as a serious task in agriculture restructuring. However, aggravating circumstance, in regard to export of agricultural and food products, first of all to EU countries, is the fact that this market is under strict protective measures within the policy of agriculture and measures of agrarian protectionism. In such conditions, it is very difficult for producers and food processors to enter such closed markets.

Considering the flexibility of small and medium enterprises with regard to production programs, as well as their capability to adjust to economical trends, it can be expected that they become one of the most important subjects of support of agribusiness development in Republic of Serbia.

Key words: SME, agribusiness development, transition, market.

1. Introduction

The use of term agribusiness should be explained at the very beginning. Literature offers many terms such as agro-complex, agro-industrial complex, food industry complex, agribusiness, etc. In this paper we will use the term agribusiness, considering definition presented by American economists Goldberg and Davis, (Ceranic, 2004) stating that agribusiness represents " the sum of all production operations and services for agricultural production, productive operations on farms, operations relating to storage, processing and sale of products produced from agricultural raw materials".

Agribusiness represents a complex business system with great variety of organizational forms, but the most important is classification into following three segments:

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- first, *pre-farm* – which includes production of organic inputs;
- second, *farm* – which includes agricultural production; and
- third, *post-farm* – which includes processing (industrial and crafts industry) and trade of agricultural and food products.

Importance of agribusiness in the economical development of Republic of Serbia or in any other observation area is evaluated through numerous parameters on demographic changes and other macro economical indices. Primarily, it is evaluated trough contribution of this sector of economy in forming of social product and national income, in establishing and improvement of external trade balance, etc.

In order to represent the position of Republic of Serbia, in this paper we will represent commonly used parameters which demonstrate that size of the agricultural household in EU varies from 4 ha in Greece to 69 ha in Great Britain, and size of landed property in Serbia is 3,28 ha. Average size of herd of dairy cows in Portugal is between 3 and 5, up to 69 in Denmark, average for EU is 24 heads of cattle, and in Serbia that average is 1 to 2 cows per household. Number of persons employed in agriculture is also very different in EU countries, so the highest share of population employed in agriculture is recorded in Greece – 17% of labor force, and the lowest in Belgium – only 2 to 3%, average for EU is 47%. In Serbia, situation is also very unfavorable - over 20% of population is engaged in agriculture. In addition, some other parameters show no good picture of the condition of agriculture. For instance, plant production makes 60% of total agricultural production, approximately 750.000 private owned farms are engaged in agricultural production, size of farms of 3 ha is predominant (58,1%), while farms of over 20 ha are presented with only 0,5%.

Of course, it is very important to give some main elements and information on implemented privatization, which is ongoing process in Serbia for over 18 years, according to different models and laws. The fact that should be pointed out is that despite the relatively long period of privatization, it is still not finished . Numerous controversies followed the previous process of privatization, and they are relating to the mode of privatization that was carried out, results of privatization and post privatization effect, but still, there are certain dilemmas on how to bring this process to the end. This is especially important since this is one of the leading sectors of domestic economy, which participates in gross added value of Serbia with approximately 15%, whereas in EU the respective value is 3,5%.

Considering stated facts, in this paper results realized so far, in support to small and medium enterprises in agribusiness development in Republic of Serbia are analyzed in more details. These are economical subjects who are of great importance because of their linkage and influence on other sectors, and because they represent great potential for employment, they can also have considerable share in export, provide food safety of the population and contribute to rural development.

2. Major elements of the development strategy of small and medium enterprises

Agriculture as a branch of economy represents very important factor of total economical development of Serbia and important segment of the economical structure. Serbia has agricultural resources that are not used enough and therefore, they represent significant economical potential for further development. Maximal utilization of available resources is conditioned by both natural and socio-economic conditions that dictate the development of certain branches of production. Prerequisite for more stable and harmonized development of Serbia is in overcoming the problem of under developed regions. Small and medium enterprises represent main source of employment and driving force of most developed countries in the World, and therefore, they should have such

importance and role in the development of our agriculture (Ceranić and Maletić, 2005; Popović 2008).

All stated here indicates the necessity of establishing of small and medium enterprises in agribusiness of Serbia. Small and medium enterprises, by definition, represent family business. In these enterprises there is one or few owners, employees are mainly family members and also, several permanently employed workers (Ceranić, et al., 2006).

Concerning the origin of small and medium enterprises in agribusiness, it should be said that they derive partially from rural farms that underwent restructuring and gained new direction in processing of agricultural and food products (Novković, 1999).

Advantage of small and medium enterprises is reflected in the following facts:

- In certain cases, there is a need for products whose volume should be smaller. Accordingly, in such cases, large enterprises do not have interest to be engaged in production, which leaves space for small and medium enterprises.
- Today, market, with its dynamic changes sets certain demands for enterprises to react to changes in a very short time. Only small and medium enterprises can respond to these challenges since their organizational structure gives them the possibility to react sooner and faster than large enterprises.
- Level of utilization of production machines, transportation means and other resources is significantly higher than in large enterprises, since entrepreneur is constantly looking for new businesses to activate existing equipment.
- In small and medium enterprises, there is no strict division of labor; employees are trained for several operations, which enable them to adjust faster to changes in work process.
- Entrepreneur in small and medium enterprise has to know very well what are the sources of procurement and to maintain stocks at an optimal level in order to provide security of his business, and, on the other hand, not to bind financial means if it is not necessary.
- From previous text, it could be concluded that there is great rivalry between SME and large enterprises. This statement is not correct, since all the countries of the world force such a form of cooperation between these two subjects, and therefore it is more realistic to talk about their complementary relations. That can be seen from Figure 1.

Figure 1 - *SME sector in European Union*

Further more, in order to illustrate a big importance of SMEs, comparative analysis of certain parameters is shown in table 1, and it refers to Serbia and nearby countries.

Table 1 - Comparative analysis

Parameter	EU-27	Czech Rep.	Poland	Slovenia	Hungary	Romania	Bulgaria	Serbia
Number of enterprises in 000	19602	878	1405	88	556	410	240	**277**
Number of employees in 000	85000	3461	5289	371	1783	2463	1318	**811**
GAV in billion EUR	3060	30	59	8	20	13	5	**6**
Number of employees per enterprise	4,3	2,8	3,8	4,2	3,2	6	5,5	**2,9**
GAV per employee in 000 EUR	**36,4**	**12,1**	**11,2**	**22,4**	**11,3**	**5,4**	**4,0**	**6,9**

Source: EUROSTAT – Statistics in focus, 31/2008.

The focus of the development of small and medium enterprises can be defined in the following way:

- Development of a sector which is capable to significantly boost economical development, increase employment and flow of foreign currency - that can be realized by agricultural and food products processing;
- Strengthening of international support and respecting of the interest of small and medium enterprises' interests at all levels: Ministry of Agriculture, Ministry of Economy and Privatization, Republic agency for development of small and medium enterprises and entrepreneurship;
- Creation of new legal environment which would alleviate development of small and medium enterprises in agribusiness;
- Realization of reforms of public services in order to provide assistance in establishing of small and medium enterprises, and at the same time to reduce administrative and bureaucracy obstacles which are present for this sector;
- Carrying out of measures with aim to alleviate the access to sources of financing to small and medium enterprises considering that food production is very sensitive;
- Connecting educational institutions and scientific research systems with small and medium enterprises in agribusiness, especially because of the fact that this is the field with low qualification structure.

3. Proposals for establishing of small and medium enterprises in agribusiness

Low level of utilization of food industry capacities of Serbia is a consequence of narrow foreign market, significant decrease of demand on the domestic market because of diminished paying capacity and inadequate production structure. Lower level of utilization of processing capacities had reflected negatively also on level and structure of primary agricultural production in Serbia.

In development of *small and medium enterprises* in the field of agribusiness, starting point was assumption that small and medium enterprises with their *special production programs* will have *secure market, economically efficient and effective production* and, in that way, they will contribute and *induce increased use and technological improvement* of existing food industry, through cooperation programs, but also through establishing of objective competition.

Development of small and medium enterprises in the field of agribusiness in Serbia should be directed to development of the following types of production programs:

1. *Production of high quality products with protected trade mark, based on modern or traditional technologies, its own raw material base, and intended primarily for export to developed countries* (products of meat industry – ham, sausages, fermented dry sausage, smoked tenderloin and other high quality products manufactured from pork; dried and in another way processed sheep products, high quality products made of turkey, duck or goose meat, goose liver; *production and processing of high quality fish* - catfish, perch, sturgeon; *fruit products* – wall nuts, hazelnuts, almonds in small packages, stewed fruits, candied fruits, fruit teas, natural fruit juices, special fruit brandies (mulberry brandy, apricot brandy, apple brandy, sour cherry brandy, cherry brandy, etc.); *products from grapes* – special and autochthonous wines, grape juices with supplement of natural fruit aromas; *vegetable products* – warm and cold processing of different types of vegetables, tomato and beet juices, ketchups, vacuum packaged sour vegetables (cabbage, cauliflower, carrot, peppers, pickles, onion, etc.), *mixed dry vegetables* (carrot, parsnip), *processing and small packages of horseradish, baby food based on vegetables.*

2. *Production and processing of «ecological» products, i.e. «healthy» food and other products made of natural raw materials* – integral flours and baked goods made on their basis, grainy «instant» food made of cereals with different supplements (dry fruits, honey, walnuts, hazelnuts, almonds, etc.), natural honey and honey products (honey with beebread, pollen, vitamins, medicinal herbs, minerals), teas and other preparations made of medicinal herbs (chamomile, Klamath weed, mint, elder, linden, nettles, black locust, black mulberry, rose hip, hawthorn berry, valerian, etc.), cosmetics preparations based on medicinal herbs and other natural raw materials, ecological packaging made of harvest remains, etc.

3. *Production intended to satisfy needs of domestic market and substitute import of products, which from natural, agro-ecological and economical aspect, can be produced in our country* – production of fresh water fish (carp, bighead carp), production of poultry eggs, production of broilers, production of wide-leaf tobacco «Virginia», production of yeast, production of dairy products, meat products, early fruits and vegetables grown in protected space, products of food industry which are currently imported (special types of cheeses, dry meat products, candy, etc.), production and processing of table mushrooms.

4. *Production intended to satisfy needs of domestic food industry and other branches of economy* – production of high quality fruit raw materials according to modern technology for the needs of conditory industry, dairy industry (dairy-fruit beverages), drying and grinding of onion and garlic for the meat industry, production of pheasant chicks and rearing of other wild game types (deer) for the needs of hunting tourism, production of protection clothes and hats.

5. *Other production* – production of fuels from harvest remains, production and processing of snails and frogs, collecting and processing of forest fruits, rearing and processing of fattening horses.

The other important presumption of development of small and medium enterprises in agribusiness is that *considerable part of turnover assets will be invested in raw material basis*, i.e. into primary agricultural production and in this way development of these enterprises will stimulate further intensifying and restructuring of agriculture of Serbia. Proposals for priority programs of development of small and medium enterprises in agribusiness are given according to groups of activities.

4. Support measures for development of small and medium enterprises in relation to European Charter

While European Charter for Small and Medium Enterprises adopted in year 2000 by 15 EU members leaves no doubt about the direction in what way the economy of Europe is going, situation in Serbia is not very clear. Namely, although Republic of Serbia has officially accepted the European Charter for Small Enterprises on the summit in Thessalonici, according to which it has obligation to prepare annual reports on sector of small enterprises, impression is that this has not become practice, yet.

Importance of principles contained in the European Charter should not be pointed out especially, but it will be useful to list them:

1. Education and training for entrepreneurship,
2. More favorable and faster start-up,
3. Better legislation and regulations,
4. Available abilities,
5. Improvement of on-line approach,
6. Improvement of business of small enterprises on domestic and foreign market,
7. Tax obligations and financial issues,
8. Strengthening of technological capacities in small enterprises,
9. Models of successful electronic business and first class support to small business,
10. Development of stronger and more efficient representation of the interests of small enterprises.

It is hard to say that any of these ten listed principles has been completely solved in Serbia. For future development of SME sector in Republic of Serbia, for strengthening its competitiveness and innovative capacities, it is necessary to create precise order in realization of principles contained in European Charter.

In any case, this is an imperative that has been accepted, and the question is how long EU will tolerate incomplete compliance to principles of European Charter.

If, at least, causes of such condition should be roughly identified, then, we primarily need to look for them in the following:

- institutions and legislation,
- poor educational level of entrepreneur and persons employed in this sector,
- unfavorable conditions for functioning of SME,
- insufficient penetration and use of innovations and technological solutions of SME.

5. Conclusion

The EU members and other market economies, consider the owners of SME as relevant economic factors. This attitude is of great importance for the Republic of Serbia, considering it is still in terms of creation of SME. Republic of Serbia is still paying tribute because of economic sanctions and a short war in the year of 1999. This tribute is mainly reflected as the lagging behind with EU countries, and even with some countries that have relatively recently become EU members and, considering socio-economic development, were far behind us.
In the process of growing globalization, small and medium sized enterprises successfully survive because they are in position to quickly identify and conquer the uncovered parts of the market. The size of the enterprise is not always a guarantee for success and, according to recent statements, the big ones will not swallow the small ones, but those that are faster will swallow the slow ones.

The situation in the Serbian economy is relatively poor, relapses from the past are still present, the economic crisis that is now present in this region represent serious threat to nullify results of implemented privatization and restructuring of the economy. Especially sensitive issue is the increasing of unemployment rate and stopping of economical flows.

The government takes a series of measures in order to quickly overcome the barriers in development of SME and small business. However, this process is neither easy nor short. Especially, we should point out the fact that on this the way we have not had so much help, as it was the case with nearby countries.

Agribusiness is one of the most important segments of Serbian economy and it represents the basis for the development of other non-farm activities. Considering the available natural resources, agribusiness is, from the national point of view, not only the basis of economic development of Serbia, but also the basis of the food safety of Serbian population.

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LITHUANIAN DIAGNOSTICS OF LAGGING TERRITORIES: EVALUATION AND INSIGHTS

William H. Meyers[1], Emilija Kairytė[2], Erika Ribašauskienė[3]

Abstract

During the period 2006-2007 diagnostics were conducted on territorial aspects of rural Lithuania with a special focus on the rural areas lagging behind. The study includes analysis of economic, demographic and social indicators of rural areas at a disaggregated level and a methodology enabling the assessment of opportunities and constraints and the comparisons of rural areas in various territories. The study objective is an improved set of diagnostics that captures territorial differences, improves the targeting of RDP measures and strengthens the framework for allocation and access to structural and rural development funds. The paper discusses diagnostic methods by reviewing concepts of rurality and presenting methods used for identifying and ranking leading and lagging territories. We use selected socio-economic indicators to describe differences among municipalities in Lithuania and identify the key factors that indicate more and less successful areas. These are then used to identify and rank leading and lagging municipalities with a development index.

Key words*:* investment, rural development, lagging rural areas, economic structure, competitiveness, social well-being, development indices, funding envelopes.

Introduction

EU and Lithuanian policy include as goals the increased cohesion of territories and reduction of socio-economic disparities and governments take seriously the difficult task of slowing the growth of inequalities and especially the growth of inequities in opportunity across different territories.

The objective of this study is to develop an improved set of diagnostics that:

1. Capture local territorial differences in opportunities and constraints and improve the targeting and qualities of RDP measures,
2. Strengthen the framework for allocation and access to structural and rural development funds.

This paper explains how the indicators are selected and used and how different indices can be obtained from these indicators and used for decision making. It forms the basis to discuss with decision makers and analysts in Government the choices that must be made in developing and using such indices, which are:

- What indicators to use

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- What weights to use in forming thematic indices
- What weights to use in forming combined rural development indices
- Where and when to apply indices for program design and implementation.

The paper discusses diagnostic methods by reviewing concepts of rurality in Europe and presenting methods to be used for identifying and ranking leading and lagging territories in Lithuania. Next, we use selected socio-economic indicators to describe differences among municipalities in Lithuania and identify the key factors that indicate more and less successful areas. In section 3 we present the thematic indices which are calculated from the selected indicators for each municipality and used to rank municipalities according to different criteria. These are then used to identify and rank leading and lagging municipalities with a combined rural development index. Finally, we draw conclusions from the analyses and make recommendations on how these results could be useful in better targeting the measures and funding of the RDP 2007-2013.

Methodology

In order to properly identify and characterize lagging rural regions, it was necessary to first decide on indicators of rurality, and then to decide on which indicators of social and economic well being or disadvantage should be used. Coming up with indicators of rurality was particularly challenging due to the disconnect between the definitions used by the Government of Lithuania, The European Commission, other New Member States and centers of expertise such as the OECD.

The OECD typology was chosen due to its simplicity and widespread use. According to this classification, local communities (NUTS 5) are considered rural if they have a population density below 150 inhabitants per square kilometer. This allows us to classify regions (NUTS 3&4) as being predominantly rural (over 50% of population living in rural communities), significantly rural (15% to 50% of population living in rural communities) or predominantly urbanized (less than 15% of population living in rural communities).

Currently, the Government of Lithuania uses two different sets of indicators to classify lagging territories – problematic areas and less favored areas: (i) Problematic areas are those municipalities where either proportion of registered unemployed and employable age population is 60% and more above the national average, or the proportion of the population receiving social allowances and other population is 60% and more above the national average; (ii) Less Favored Areas are agricultural areas where characteristics include cereal yields lower than 80% of national average, value of total agricultural production per capita is lower than 80% of national average, population density is less than 50% of the national average, the percentage of the active population engaged in agriculture is more than 15%, the rate of population decline is 0.5% or more per year, or the territory is classed as a Karst area or covered by NATURA 2000.

This study is focused on developing a comprehensive typology that could address multiple aspects of area based socio-economic disadvantage. After an extensive review of different methodologies and indicators for characterizing lagging rural regions, it was decided to use those indicators suggested by Bryden and colleagues[4]. These indicators were combined with

4 Bryden, J. M., Copus, A. and MacLeod. 2002. "Rural Development Indicators" in the Report of the PASI project, Phase 1. Report for Eurostat with LANDSIS, Luxembourg.

those recommended in a guidance note produced by the European Commission[5]. It was then determined which of these indicators were available at the NUTS 3 level (Counties), and at the NUTS 4 level (Municipalities). Because there is often a mix of leading and lagging municipalities which are hidden in the NUTS 3 aggregation, it was decided to focus on the data available at the NUTS 4 level. This allows for a more detailed comparison between levels of socio-economic well being in different parts of the country. The indicators selected are grouped according to the following themes: demographic, social well-being, investment and business, and agriculture.

By some measures there is convergence among regions in Lithuania over time and by other measures there is growing disparity. This is described by using a few of the indicators. For example, over the period 2003 to 2005, unemployment dropped more quickly in the highest unemployment regions, so the gap between the highest and lowest among municipalities narrowed by that measure. Similar convergence could be seen in social payments and average population change. By contrast, monthly earnings per capita grew in general; but the gap between the highest and lowest among municipalities also increased slightly. By far the largest disparity was in the comparison of investment in tangible fixed assets per capita, which moved up and down, but the gap between highest and lowest remained large and was about 25 percent higher in 2005 compared with 2003. It was also noticeable that municipalities with higher investment levels also tended to have higher earnings per capita, and those with higher dependency ratios tended to have lower earnings per capita. These correlations are not at all surprising and merely confirm the importance of these indicators.

The indicators identified were further used to construct indices which could then be added together in order to rank Lithuanian municipalities using a combined "rural development index". The indicators which were used to construct this index are presented in Table 1, and are grouped according to four different dimensions of socio-economic well being for Lithuanian municipalities. These dimensions represent the data available at the municipal (NUTS 4) level on socio-economic well being in Lithuania. The thematic groups were demographic status, social well being, business and investment, and agricultural. In each case, we usually had several indicators in each category and used principle component analysis to select the more important of these and avoid using indicators that were highly correlated with each other.

Table 1 - Indicators used to construct the combined rural development index

Demographic status	Social well being	Business and investment	Agricultural
- % of population over working age Jan 06 (-) -Average annual population change 04/03 to 06/05(+)	-Unemployment rate 05 (-) -Average earnings per capita 05 (+)	-New business formation, average 03/02 to 05/04(+) -Investment per capita in tangible fixed assets, average 03 to 05(+) -FDI per capita, average 03-05 (+)	-Ave farm size (+) -Ag Land Quality (+) -% of agricultural employment (-) -Holdings as % of agr land (+) -LFA as % agr land (-)

+ positive indicator, - negative indicator

5 European Commission - Directorate General for Agriculture. 2006. Guidance note G – Baseline Data. (Preliminary document under negotiation with member states).

Since these indicators were expressed in different forms such as percentages, hectares, liters per capita etc, they needed to be standardized so a composite index could be constructed.

The formula used for indicators where *high values are considered good* (e.g. average earnings, new business formation, land quality etc) is as follows:

F = (variable X minus mean of X)/(standard deviation of X).

For indicators where *high values are considered bad*, the formula used was the following:

F = (mean of X minus variable X)/(standard deviation of X).

Each thematic index is formed by giving the same weight to each of the indicators within that theme. For example, unemployment and average earnings per capita each have a 50 % weight in the Social Well-being index. For the purpose of constructing a composite rural development index it was decided to add the four thematic components together with equal weights (though they could as well be given different weights depending on priorities of policy makers). This index was used to create five categories of territories: (i) leading, (ii) promising, (iii) intermediate, (iv) lagging, and (v) severely lagging. Cities are outside as an additional non-ranked category.

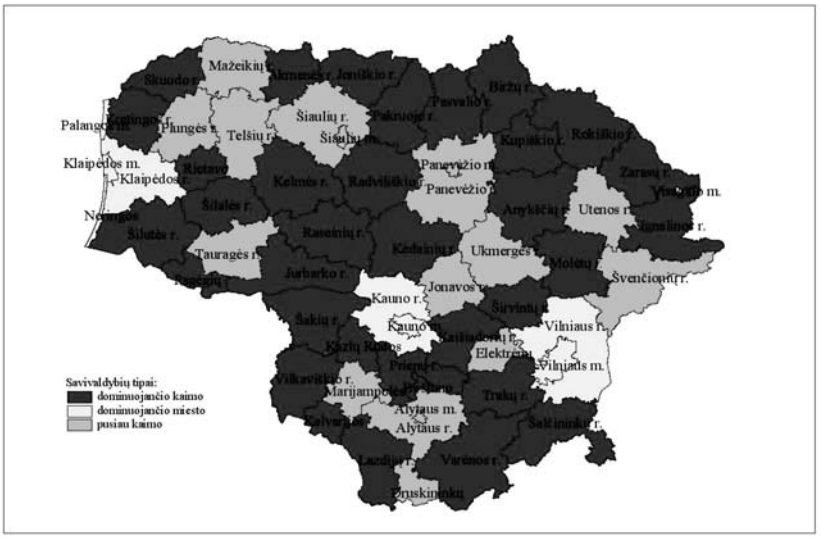
Key Findings

The map below (Figure 1) shows that most of the municipalities in Lithuania are predominantly rural. Over 50% of the population lives in 'predominantly rural' communities' (dark green), and much of the remaining territory is significantly rural (light green). While it is important to identify rural areas, it is also important to look beyond this classification in order to understand the spatial distribution of social and economic well being in rural Lithuania.

There are two official classifications of disadvantaged rural territories in Lithuania. One is the Less Favored Area classification, which is based on indicators of agricultural performance and potential. The other category is "problematic" areas which are based on a limited set of indicators of social disadvantage**.** Overall, less favored areas, problematic areas, as well as territories where less favored areas and problematic areas overlap tend to be disbursed throughout the country, except in the more productive central area and near the larger cities in the East and West. However, there is some clustering of 'problematic' areas along the borders with Belarus, Poland, and Russia. Again, these classifications are not sufficiently specific to separate the lagging from the developing regions.

While the problematic area approach represents a useful starting point for understanding the spatial distribution of socio-economic well being in Lithuania, it relies on a limited set of indicators. What follows is a discussion of the results from the set of indicators chosen according to the recommendations of Bryden and colleagues[1] and the European Commission[2]. These include indicators of demographic status, social well-being, business and investment, and agricultural performance and potential (presented above in table 1). Each of these categories represents a separate index of socio-economic well being in Lithuania. The following are the main findings of the analysis of the spatial distribution of each of these indices:

Figure 1 - Rural Lithuanian typology according to OECD methodology



1. ***The spatial distribution of the index of demographic status suggests that the leading regions (which have low levels of retired population and high levels of population increase) tend to be clustered around Lithuania's cities.*** On the other hand, municipalities which are lagging demographically are clustered in North East and South of the Country (with the exception of Kelmes and Sakiu).
2. ***According to the social well-being index, there is a cluster of lagging municipalities along the border regions, while other lagging municipalities tend to be dispersed throughout the country.*** There are two major groups of leading municipalities, one clustered in the center of the country in close proximity to the urban areas of Vilnius and Kaunas, while the other cluster is along the coast and Northwest in proximity to the port city of Klaipeda, resort city of Palanga and the industrial town of Mazeikiai. The indicators used for this index included unemployment and average earnings per capita.
3. ***The distribution of lagging and leading municipalities according to business formation and investment follows a pattern with leading municipalities tending to be in close proximity to major urban areas, resorts and industrial towns,*** while lagging municipalities are more remote from these economic activity poles and/or clustered along the borders with Russia, Poland, and Belarus.
4. ***According to the index of agricultural performance and structure both lagging and leading municipalities form distinct clusters that appear unrelated to urban proximity but rather to land resources and productivity.*** Accordingly, leading agricultural municipalities are clustered in the center of the Country, while lagging areas are clustered in the East, South East and South West, where soils and land productivity are lower. This is somewhat different to the spatial distribution of other indices.

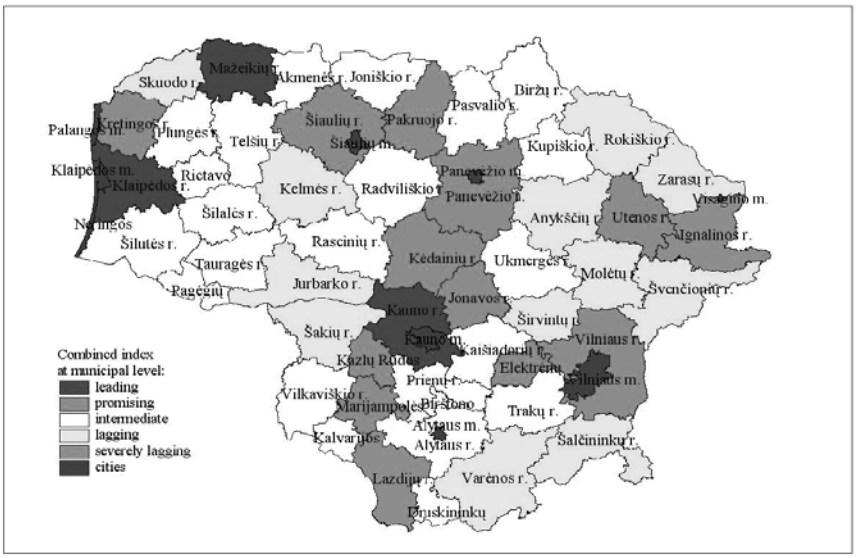
The final element of the analysis is the combined rural development index, which merely

combines all four thematic indices into one, with equal weights given to each of them to create a measure for classifying lagging rural areas in Lithuania. Five categories of municipality are designated – leading, promising, intermediate, lagging, severely lagging, and cities.

The map in Figure 2 shows that most municipalities are in the intermediate to leading categories. Those which fall into the lagging or severely lagging categories tend to be more remote from urban or industrial centers and/or located on the border with Russia, Poland or Belarus. It is also the case that no lagging or severely lagging municipality is adjacent to or contains a city.

These territorial rankings can be used to ***select appropriate measures and/or develop mechanisms to increase project or program funding*** for lagging areas and thereby shift development resources from leading to lagging areas. Thus, it is useful to state a rationale for such targeting. First, it is clear that investment is critical to increased development and well-being of any territory, so greater access to such investment opportunities clearly means improved development potential. Second, there are direct and indirect benefits of developing rural places. Direct benefits are the effect of solving equity issues and increasing social cohesion. The indirect one is the potential reduction in the budgetary cost of various social and safety net programs. If lagging regions develop faster, the need for government spending on social cohesion and equity programs will be reduced.

Figure 2 - Distribution of municipalities according to combined rural development index



It has been shown that lagging areas in Lithuania are not concentrated in one part of the country but are often in border regions and peripheral areas. The reasons for lagging may differ in different municipalities, so different measures or remedies may be implied for different areas. Also, this more scattered distribution of Lithuania's lagging territories generates an opportunity for "growth pole" effects of regional cities and municipal centers.

Lagging conditions are in part due to fixed resource endowments and location that clearly cannot be changed. However, they can also be due to limited access to human and financial recources to enhance labour and capital productivity. This aspect of the lagging condition can

be changed, and part of the remedy may be in the ***design and funding*** of public investment programs.

There are several means to enhance targeting to promote development of lagging regions. A main principal is to design and implement programs so as to ensure sufficient access for those regions and those entrepreneurs that may be disadvantaged by location or knowledge. Among the means that can be used are:

1. Regionalization – territorial (place-based) approach to allocation of funds
2. Set maximum grant size to broaden opportunities for participation (smaller grant % for bigger projects)
3. Technical assistance to improve capacity of lagging areas to participate, since they are less well prepared to compete at a national level
4. Give priority funding - does not mean accepting bad investment projects, but rather to ensure access and a level playing field for lagging municipalities.

We suggest ways to regionalize the funding of selected programs or measures.

Generally, lagging regions have had constrained access to development programs. They are less well prepared to compete at a national level and are often crowded out by quicker and better informed applicants in prosperous areas. It must also be recognized that envelopes are not the only remedy. Capacity building in these lagging regions is also necessary, so they improve ability to compete for program resources.

An allocation index can be calculated that could be used in combination with other factors to make a funding envelope for each municipality that includes some consideration of the combined rural development index (CRDI). We suggest an allocation based on three variables – rural population, average income, and CRDI, though other combinations are also valid. The CRDI functions as an allocation index, with higher allocations going to those municipalities with the lower index scores.

One mechanism for ensuring that such funds are fully and productively utilized, is to provide indicative allocations which would be subject to periodic review, and possible reallocation if the local authority (or local action group in the case of LEADER) is not able to develop viable projects within the appropriate time frame. These reallocation decisions would be made on the basis of successful absorption of the funds allocated, along with other region's performance indicators (Saktina et al).

Conclusions and Recommendations

The extended process of collecting data and comparing characteristics of different municipalities has clearly demonstrated the importance of abundant and high quality data at the most detailed possible level. This is especially a problem in rural territories, where there is less data available. Separating rural territories from urban areas is practically impossible except for the major cities. In general, there is a need for more years of data and more recent data for some factors. NUTS 3 level data are not very helpful because they are too aggregate to identify territorial differences, but data for NUTS 4 and NUTS 5 levels is rather limited.

Diagnostics will be improved if better data is available, and it would help to improve program design and implementation too. Improved data should include more indicators reported by Department of Statistics, increasing coverage of existing data for rural area, and possibly

surveys to gauge the attitudes and behavior of the rural population. Among the most important data that were not available at the NUTS 4 level were GDP per capita and the education levels of the population (which would reflect the quality of labor).

A well organized and detailed monitoring system would be of great value in tracking the improvements or deterioration of conditions in different communities and regions. It would be a way to institutionalize the type of analysis of territorial characteristics that has been reported here.

In order to improve access of disadvantaged or lagging areas to the programs and development resources of EU and National programs, it is important to take a place-based approach to evaluation of needs and the development of solutions. This includes building the capacity of peripheral and lagging areas through training and bottom-up approaches to local development, designing and managing programs so that there is wide access available, and using regional envelopes to prevent project resources from being dominated by a few large projects in prosperous regions.

It is important to solve co-financing problems of EU supported projects for eligible applicants who lack the personal financial requirements. Possible mechanisms and measures providing exemptions or increasing the grant share of projects should be considered in order to increase absorption of project funding in lagging areas where access to co-financing is constrained.

This study has demonstrated how to use socio-economic indicators to identify lagging areas and to develop envelopes as indicative funding levels to encourage broader participation and prevent resources from being monopolized by a few, prosperous areas and entrepreneurs. Such an allocation approach could be designed for specific measures or a broader range of activities or programs. There is not only one way of making such allocation computations. Important policy decisions on such envelopes are where and when to apply them, what factors to include in them, what weights to use if more than one indicator would be needed for that, and finally a mechanism for reallocation of funding resources if a region is not able to use it.

Finally, there are different problematic areas with potentially different criteria for support during the 2007-13 programming period, but it could be useful to consider all the lists of lagging areas in applying measures to different territories. For example, the Lithuanian Ministry of Interior (MoI) is looking only at their list of two indicators, which, as this study showed, are not correlated with income and investment disadvantages. So, while some of their lagging areas are the same as in this study, some of the lagging ones identified in this study are not included in the MoI list. Also, some of their "disadvantaged areas" are not disadvantaged ones according to other indicators. So the method of this study with a broader list of indicators could be helpful in reassessing the ranking of assistance receivers.

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FACTORS OF DEVELOPMENT OF COMPETITIVENESS: THE CASE OF ORGANIC-AGRITOURISM

Donatella Privitera[1]

Abstract

Many farmers, in addition to normal farming activities, have already turned to agritourism as a source of additional farm income and opportunities. There are numerous benefits to be gained from the development of agritourism: it may strengthen local economy, create job opportunities and develop and promote training and certification programs to introduce young people to agriculture and the environment. Agritourism helps preserve rural lifestyles and landscape and offers the opportunity to provide "sustainable" tourism.

Organic agriculture is due to demand for healthy foods with a high quality standard and limited use of chemical substances. Organic agriculture is closely connected to agritourism and tourism.

The purpose of this paper is to identify and examine those factors that have helped rural communities to successfully develop agritourism, in particular organic-agritourism, and to discuss its entrepreneurship opportunities. Several focus groups were conducted with local business people and leaders regarding an applicative case of Southern Italy.

Keywords: agritourism, organic agriculture, competitiveness

Introduction

Agritourism helps preserve rural lifestyles and landscapes, including strengthening local networks, culture and traditions (Ventura, Milone, 2000). Moreover, it provides additional outlets for the sale of local crafts and food items (typical products). Agritourism also offers the opportunity to provide "sustainable" or "green" tourism or "farm tourism" (Busby, Rendle, 2000). It also includes educational tours, tasting events, agricultural museums, commodity festivals, wildlife, etc. All of these examples can be considered opportunities for consumers and farms to generate a meaningful exchange of values.

In the literature there is a great variety of terminology, sometimes with different meanings, which makes it difficult to define tourism in rural areas (Greffe, 1992; Lane, 1994; Bramwell 1994; Seaton et al. 1994).

According to Lane (1994) rural tourism should: be located in rural areas, (...) functionally rural, (...) rural in scale i.e. usually small-scale; be (...) traditional in character; grow slowly and organically; be connected with local families; and (...) represent the complex pattern of rural environment, economy, history and location. However the concept of rural tourism is slightly different from the definition used by Lane (1994) who includes farm-based tourism within rural tourism.

Similarly, Maetzold (2002), defined agritourism as an alternative enterprise.." a set of activities that occur when people link travel with products, services and experiences of agriculture"; Che et al. (2005) state that "agritourism is another consumptive use of farmland and may help preserve

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farms". But other authors suggest that agritourism is not necessarily a solution to the problems facing rural areas (Gannon 1994; Sharpley 2002).

Within these definitions, as far as demand is concerned, a new genre of tourists (*eco-tourists*) has emerged. In particular, sustainable tourism refers to every form of tourist activity that respects and preserves the natural, cultural and social integrity of the area in the long-term and contributes in a positive and fair way to economic development and to the well-being of the people who live and work in these areas (WTO, 1998). In the literature, many researchers have written about *ecotourism* (Hunter, 1997; Hultsman 1995; Weaver, Lawton, 2007) but it is necessary to link the meaning of the term within the context in which it is used because it depends on the level of development of each destination, type of supply and target market (Franch et al., 2008). Another related term is *responsible tourism* based on ethical values with attention to the economic, environmental, and social impact of tourist activities (Goodwin, Francis, 2003).

Currently, in Italy agritourism is regulated by a Law (L. 5/12/1985 n. 730 now superseded by art. 14 L. 20/2/ 2006 n. 96; sentence Court of Cassazione 2/10/2008, n. 24430) that defines agritourism as: "accommodation and hospitality activities carried out by farmers…, through the utilization of their own farms in connection with the activities of the cultivation of the land, of forestry, and of the raising of animals". Italy is the only country in the European Union that has specific laws regulating agritourism, whereas elsewhere this particular type of accommodation is included in the more general sector of rural tourism. In our country, agritourism has managed to carve out a considerable space for itself in the area of so-called "non-traditional tourism" to such an extent that besides being an integral source of income for farms, it represents a valid tool of competitiveness and development of enterprises in rural areas. In fact, in those places agricultural activity is combined with the hospitality industry: a more important synthesis of the multifunctional role of agriculture. The concept of multi-functionality, debated by scholars but also by the most important international institutions (European Commission 1999) is used to indicate the wide and varied range of functions (private, social and public) that agriculture can carry out in addition to the strictly productive one (OECD 2001; Idda and others, 2005).

In Italy, the agritourism sector is closely linked to the agro-food market and is therefore influenced by this trend; in particular, it is linked to the growing success of local products and those food products obtained by sustainable processing and sold directly on the farm. Besides, the evolution and diversification of the market of tourism services has given a great impulse to the national supply of agritourism, exploiting also the possibilities of technological innovations in order to promote a particular service/product (e.g. websites).

Organic agriculture is a cultural evolution with origins in an environmentalist culture. Furthermore, the focus on these products is due to demand for healthy foods of a high quality standard with a limited use of chemical substances. Organic agriculture and agritourism are closely linked and there is no doubt that gastronomic and natural tourism has a considerable role in the future development of rural areas.

In this paper I will try to highlight what is meant by agritourism and organic-agro tourism and also try to make a general assessment of the Italian phenomenon. I also aim to investigate the role of organic-agritourism, as a tool for development of the landscape and attraction for sustainable tourism. Besides, in an applicative case, in an area of Southern Italy, I have tried to identify the critical factors and the success of the organic agro tourism observed.

Analysis of the context: agritourism and organic-agritourism in Italy

The phenomenon of agritourism has reached a consistent level of diffusion in Italy. The most recent official statistics refer to about 18,000 authorised enterprises nationwide (tab. 1), with an annual increase of 5,7%. In particular, in the five-year period 2003-2007, the entire sector shows an overall

growth regarding accommodation, in terms of farms (37.3%), beds (38.2%) and places in campsites (55.4%); catering, regarding farms (37.3%), and the number of seats in restaurants (38.2%); tasting of local products and other activities that concern a growing number of enterprises that offer services that are on the increase (nature watching, courses); some of them have increased considerably.

The analysis of the data shows a development both overall and also in the individual types of activity. The reasons for the constant growth can on the one hand be found in the deep recession that has hit the agricultural sector, leading entrepreneurs to diversify what they have to offer and to take tourism into consideration, and on the other hand can be found in the ever increasing demand by consumers seeking cultural and social traditions, and who want to discover natural places that are little known and also to rediscover the genuine tastes of traditional Italian cuisine.

More than half of agritourism enterprises are situated in hills (51.4%) and more than a third are in the mountains (34.5%); agritourism appears to be an important element for sustaining and developing both human presence and primary economic activity in areas of less specialisation and competitiveness regarding agriculture (ISTAT 2008). 44.5% of all agritourism enterprises are concentrated in the north of the country, 35.6% in the centre and the remaining 19.9% are in the south and islands.

Table 1 - Kind of agritourism – 2003-2007

	2003.	2004.	2005.	2006.	2007.	Variation % 2007/2003
Accommodation						
n.° farms	10.797	11.575	12.593	13.854	14.822	37.3
N° beds	130.195	140.685	150.856	167.087	179.985	38.2
N° campsite places	4.540	5.386	5.826	6.935	7.055	55.4
Catering						
n.° farms	6.139	6.833	7.201	7.898	8.516	38.7
Seats at table	249.342	266.654	277.856	298.003	322.145	29.2
Tasting of local products						
n.° farms	2.426	2.737	2.542	2.664	3.278	35.1
Other Activities						
n.° farms	7.436	8.240	8.755	9.643	9.715	30.6
Riding	1.364	1.494	1.478	1.557	1.559	14.3
Excursions	2.452	2.692	2.981	3.131	2.879	17.4
Nature watching	224	265	575	517	558	149.1
Trekking	1.350	1.463	1.426	1.465	1.629	20.7
Mountain bike	2.101	2.422	2.258	2.311	2.347	11.7
Courses	693	812	942	1.025	1.256	81.2
Sport	2.927	3.006	3.474	3.682	3.758	28.4
Other	3.786	4.003	4.288	5.043	5.395	42.5
Total Farms	**13.019**	**14.017**	**15.327**	**16.765**	**17.720**	**36.1**
	100	*107.6*	*117.7*	*128.7*	*136.1*	

Source: ISTAT 2008

The Italian enterprises are almost all family-run; very few tend to take on employees from outside the family or join co-operatives and associations. By and large, the owners have a low cultural

level and do not speak foreign languages, though this does not appear to discourage the flow of tourists. Amongst operators, this sector is considered to be among the tourist activities with the highest potential for development since a particularly attractive countryside together with local wine and gastronomy is especially favourable for this kind of tourism.

Among the agritourism enterprises, one can distinguish between those that carry out a traditional type of hospitality establishment and "organic agriturism establishments" - those that are licensed to produce and sell organic agricultural products (figure 1). The label is given to them by the AIAB, The Italian Association for Organic Agriculture.

Since 1998 it has guaranteed that it deals with regulated enterprises, not only regarding respect for the rules of organic agriculture (according to EC regulations CE 2092/91 and 392/04), but also as regards respecting ethical and ecological regulations in the running of a hospitality establishment (control by ICEA inspectors – Institution for ethical and environmental certification).

The model of organic agritourism has similar characteristics to traditional agritourism enterprises (figure 1) but is understood also as an instrument of integration between protection of the environment and natural resources, both referring to productive activity and also tourist facilities. The environmental variable takes on a strategic function with reference to the services offered, including educational, tourist, and catering services, and sale of food products. Transport and road networks also have to respect sustainability.

The obligations of the entrepreneur concern actions aimed at the conservation of the environmental, historical and cultural heritage and reclaiming rural areas. In fact, the management of enterprises could be aimed at protection of the environment through energy saving and the rational use of resources with the production and exploitation of alternative energy sources.

Besides, the organic agritourism establishment should put into operation, through the choice of technological solutions, a programme of water saving and purification and recycling of re fluent water, and provide and promote ecological means of transport for guests or direct them towards methods of 'slow' moving.

The organic agritourism establishment stands out also for its educational-ecological function, encouraging awareness of the environment amongst the young, which is vital in order to protect, appreciate and discover nature, landscape and the works and culture of man.

Agro-ecotourism development is based on organic agriculture and combines with ecotourism to provide an acceptable recreation opportunity without destroying the natural environment (Kuo, Chiu 2006).

Therefore, organic agritourism comprises an integrated strategy for carrying out tourism activities in rural areas. However, it must be said that many activities and concepts inherent in organic agritourism in Italy derive from traditional ones and more often than not focus mainly on the organic aspect of food products. Regarding the current levels of organic agritourism in Italy, the source BIO Bank reports the existence of 1.002 enterprises registered in 2007 with a rise of 46% compared to 2002.

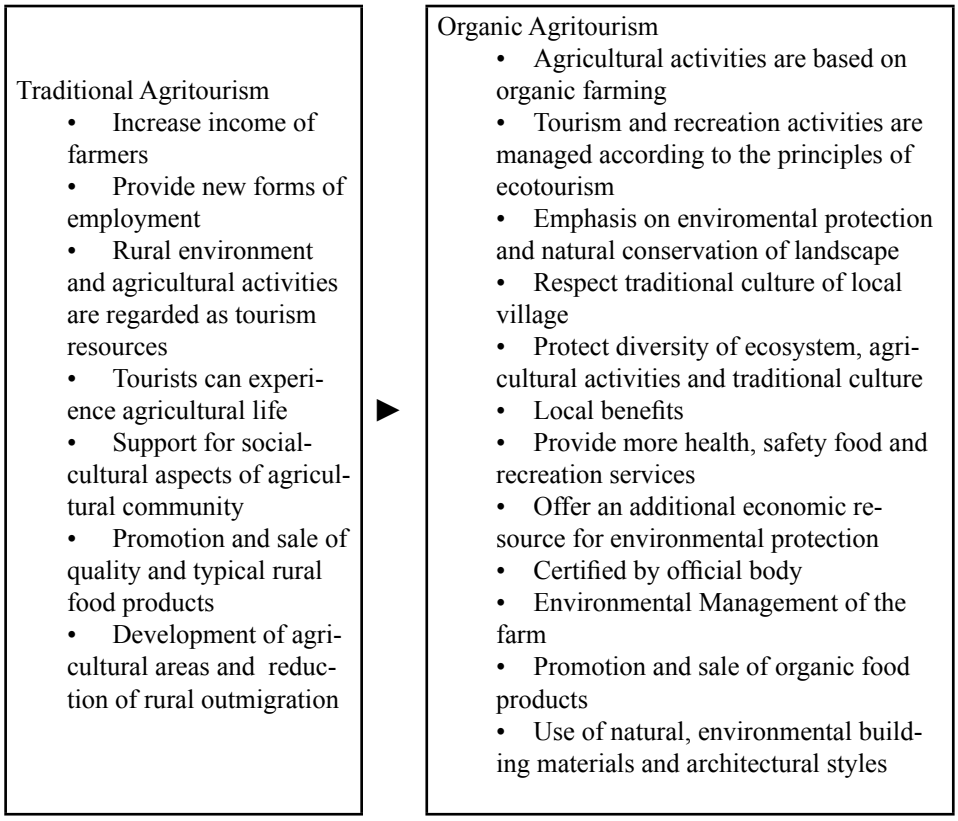
Methodology notes

The survey was carried out in three stages.

The first phase, regarding agritourism and organic-agritourism definitions specifying the characteristics of organic agritourism enterprises, was mainly cognitive. It was carried out on

the basis of official statistics and the available literature, as well as by means of interviews with selected spokesmen. These were chosen in such a way as to represent the points of contact between enterprises and institutions.

Figure 1 - Characteristics of Traditional agritourism and Organic agritourism (L. 5/12/1985 n. 730; Kuo and Chiu, 2006)



The second stage was substantially an applicative case of organic agritourism in Sicily, a region of Southern Italy, with detailed analysis of what is currently on offer by enterprises connected with agriculture, particularly organic agritourism. Several focus groups were conducted with local business people. Participating agritourism producers were asked about their experience with agritourism and also organic agriculture, general perceptions and knowledge of other agritourism enterprises, potential benefits and disadvantages compared to traditional agritourism, synergy with territory, aspects of marketing, the importance of landscape, etc.. These operators identified key issues regarding the development and the differences between organic agritourism and traditional agritourism (fig. 2). Each operator was asked to assess the importance of each key issue and to rank them in a hierarchy of importance.

As a conceptual framework we chose the study of Wilson et al. (2001). This analysis adopts a qualitative method (in-depth interviews with focus groups) and has a community approach, which means that farm tourism is considered within its local economic context. The implication for policy makers is to support the whole community around the farm facility in order to generate multiple effects and positive externalities (e.g. the preservation of regional traditions and local food variety).

Presence on the Internet was used as criteria to choose the farms. The operators' sites and the

information presented were analysed in order to certify the key issues defined. In order to evaluate the usefulness of the key issues chosen were studied 40 organic agritourism enterprises, all certified and with websites. Two assessment scales were used: a binary scale 0/1 to assess the presence or absence of certain information in the sites examined (e.g. communication of the importance of the organic certification, history of the company, etc.) a scale of 0-5 (0 – absence, 1- very bad, 2 – bad, 3- average, 4 – good, 5 – excellent) to assess those variables where it was possible to give a qualitative judgement. Subsequently, the data was re-grouped once more and highlighted on a map that summarises the behaviours of the entrepreneurs regarding the key issues.

Figure 2 - Key Issues

- Hydrogeology equilibrium and conservation
- Promotion and sale of organic food products
- Synergy between farms and territory
- Importance of communicating to tourists about organic agriculture
- Protecting and improving rural buildings
- Increase in biodiversity
- Protect diversity of ecosystem, natural conservation of landscape
- Work opportunities and reduction of the number of young people who leave rural areas
- Rise in popularity and improved image
- Animal welfare
- Incentive for cultural activities and rural recreation
- Environmental and natural wellbeing of rural areas
- Development and rise of local tourism

Discussion and results

The sample analysed 40 enterprises (Table 2) which is purely indicative but representative (in total in Sicily 49 certified as organic agritourism). As far as accommodation is concerned, it appears that more than half the sample can offer 1-25 beds while just 1 farm offers none. 20.0% of the sample falls into the 26-100 bed category. The number of rooms per farm rather than accommodation unit is considered.

Table 2 - Some characteristics of organic-agritourism in Sicily - 2008

		n°	%
Total Farms		40	100
Accommodation			
	1-25	31	77.5
	26-100	8	20.0
	none	1	2.5
Catering			
	1-30	12	30.0
	31-100	12	30.0
	>100	5	12.5
	none	8	20.0
Open			
	all year	35	87.5
	seasonal	5	12.5

The number of enterprises remaining open all year (almost 87,5%) is significant, considering the fact that one of the main points in the regional tourist development programme is to attract visitors all year round and not just in the summer.

Sicilian organic agritourism (indeed, the entire agritourism sector) is mainly orientated towards catering, and in particular towards offering meals to a large number of clients. This propensity probably arises from the fact that in many farms accommodation is linked to the provision of meals (lunch rather than dinner) as for residential clients it represents an opportunity to visit places that are nearby but at the same time far away from the urban centres. The services offered by the farms appear to be quite varied and include innovative ideas considering the fact that sector is relatively new, such as cookery courses and entertainment for children and adults and sale of organic food products.

Together with the better known activities offered by nearly all the farms, such as nature observation, the possibility to go on excursions or take part in farming practices, and the hiring of bicycles is widespread as is the presence of stables and the hiring of horses. A swimming pool was available on just 10 farms, even though this service is much sought-after. All the farms sell their own certified agro-alimentary products.

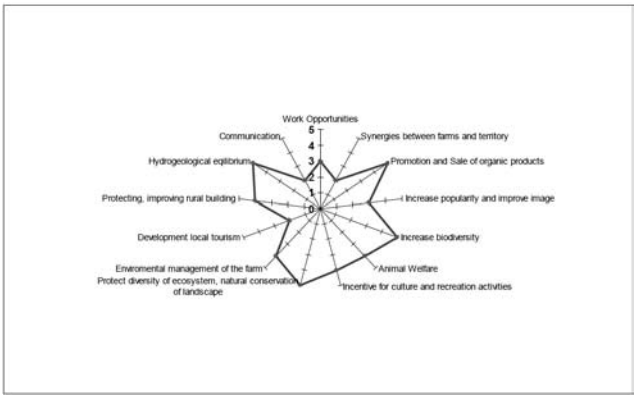
However, the presence of a varied and significant natural and cultural heritage is not enough to make these areas attractive. Organic-agritourism has provided those areas that are not on the coast with the opportunity for an increasing number of agricultural enterprises to supplement their modest income from arable farming and/or raising livestock. Within the study of the comparison of traditional and organic-agritourism and the choice of key issues (see figure 2), the response of these enterprises was represented in a descriptive map (figure 3).

We have identified some critical weak points: in particular we can note the lack of communication and collective promotion, expressed by all private operators, considering the lack of visibility on the market of knowledge of these organic-agritourism establishments (in fact, the value indicator is equal to 2). Initiatives promoted to this regard have been very limiting and generic. They recognize very importance to publicity campaigns by the association AIAB or public institutions.

The synergy between the firms and the region got a low mark, or rather the contribution of local bodies to the definition of regional development plans aimed at increasing the general level of 'attraction' of the regional supply, although there is a high level of collaboration and trust between individual economic operators. An optimum management of resources, together with elements characterising the region could therefore lead to the realisation of supply systems that are competitive both for the entire compartment and for the region concerned.

The factors Hydrogeological equilibrium and conservation, Promoting and sale of organic food products, Increased biodiversity, Protection of diversity of ecosystem, natural conservation of landscape, got top marks because according to the entrepreneurs, they best represent the characteristics and aims of organic-agritourism firms.

Figure 4 – Positioning of organic agritourism enterprises compared to key issues



Conclusion

The study has brought to light the potential and importance of an integrated development of the supply of organic agritourism. Sicily, the region studied, has been relatively significant for the aims of this study but it was important to highlight the special characteristics of organic agritourism enterprises compared to traditional ones.

Over the years, the need has arisen to consider tourism a strategic means of development to be included in a well defined general programme. The various initiatives leading to public policies should be aimed at the production of a programme outline with clear objectives.

In fact, on one hand, the competitiveness of a tourism supply depends more and more often on the variety and quality of the proposals it can offer an ever more varied and demanding market, while on the other hand, definitive progress towards tourism as an industry necessarily implies a more rational organisation of resources, leading to less temporal oscillation in the amount of tourist traffic and consequently greater economic solidity and more employment stability.

In the light of the above considerations, the development and expansion of an agritourism sector, in particular organic, may be one alternative for improving the incomes and potential economic viability of small farms and rural communities, but it is by no means a remedy for all farms looking for additional income. Nevertheless the scope of our research is reduced to the Sicilian panorama of farm tourism. Further studies, also within a cross-country's approach, could highlight chances and differences of this type of tourism. In any case, these elements provide useful information relative to possible interventions aiming at rural development.

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THE ROLE OF CONSULTANCY IN THE PROCESS OF APPLYING FOR EUROPEAN FUNDS FOR RURAL DEVELOPMENT

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Abstract

In the context of the present world economical crisis, the pre-accession and structural funds assigned by the European Union (which have been and still are high for Romania) can represent an important financial support for ensuring the sources of sustaining the investments meant to contribute to increase the living standard in rural areas, in the case of acceding countries and for member states that joined in 2004 and 2007.

Still, for countries it is important to have a high level of acceding these funds, because history proved that few countries absorbed the whole amount of money from the pre-accession funds (Czech Republic is a positive example in this context) and the structural funds (Spain and Portugal are positive examples in this context).

An important factor in accessing European funds is represented by the structures of consultancy (public and private) that may advise the potential beneficiaries of these funds, for both elaborating the projects of investments and their implementation.

Key words: accessing, beneficiaries, consultancy, economical crisis, rural development, European funds, projects of investments

Introduction

On the agricultural market the inflationary pressures are increasing based on some agricultural problems globally manifested since previous years, like droughts and population growth have added new pressure on prices. In consequence, inflationary trend is likely to continue for an indefinite period on the market agro-food market. The agro-food companies had to face in recent years increases of the cost of raw materials, and for these increases to not affect their earnings have transferred increases to consumers.

Higher costs have equated with higher final prices. The food price inflation is a constant worldwide concern because it affects all segments of the population. Consumers and producers around the world are facing higher prices for the agro food products. Now, they all pay more for the products. Moreover, the food represents the most important component of the basket of the consumer and an important part of household expenditure.

At the same time, however, inflation creates in general, a very volatile and difficult environment, but where there are opportunities for investors. A solution for an investor would be the approach "if you can not beat them ... joins them". If food prices have a rising trend due to the increased raw material prices, why not invest in these markets? They should invest in equipment and thus to benefit from rising food prices. Investors should invest in companies that produce agricultural goods, as the most appropriate to benefit from the food price inflation.

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Moreover, the worldwide demand for food has increased for vegetables, dairy products, fruit or meat with high value. It is quite difficult for a small farm to benefit from this trend. However, taking into account the emergence of the food price inflation, and the current financial crisis, we expect an increase doubt of banks to finance such investments, which will have negative consequences for farmers and food companies, which will be difficult to access loans.

A good result can be achieved only when the entrepreneurs are faced with budgetary constraints that can limit performance. This is the area in which investors can have a pro-active involvement, however, to increase production, farmers need to renew the existing equipment, introduce new technologies, all of the above involve substantial investment in the farm. The status of technology is a result of the significant cost of trading. For this, the available technology and performance interact in many areas.

The business environment should allocate more resources to certain tasks such as obtaining information, purchasing inputs and marketing of sites and all of this requires all major financial resources. On the other hand, improved technology will improve farmers' access to raw materials and will enable them to improve productivity and quality of final products. Private investment should be made not only in agriculture but also in warehouses, processing industry and retail.

Accessing EU funds - solution for overcoming crisis

A viable solution to solve the problems that Romanian agriculture is facing, widened further in the context of the current situation in financial markets can be community funds for financing agriculture and rural development.

Thus a special attention should be given to promote a program of balanced development of all rural regions of our country, under a concept of rural development that refers to the economic and social integration of the Romanian villages, while providing a favorable environment for attracting foreign capital advantageous conditions in order to support investment and development programs of agricultural production. Particular attention should be paid to implement the programs, projects conducted by the World Bank and other programs with foreign funding.

Moreover, through the European Agricultural Fund for Rural Development (EAFRD), Romania has allocated 8.022 billion euros, which adds a 20% national co-financing provided by the state budget. For the period 2007-2013, through the National Program of Rural Development (PNDR) are implemented appropriate measures grouped into 4 priorities:

- Increased competitiveness of agriculture and forestry sectors (Axis 1) – The total funds allocated for the period 2007-2013 - Euro 3,967,311,581, of which EAFRD contribution in the amount of 3,173,849,264 euros
- Improving the environment and the rural space (Axis 2) - the total allocated funds allocated for the period 2007-2013 - Euro 2,293,413,375, of which EAFRD contribution in the amount of 1,880,598,967 euros
- Quality of life in rural areas and diversify the rural economy (axis 3) - the total allocated funds for the period 2007-2013 - of which 2,473,739,880 Euro EAFRD contribution - 1,978,991,904 Euro
- LEADER axis (Axis 4) - total allocated funds allocated for the period 2007-2013 - Euro 235,074,871, of which EAFRD contribution in the amount of 188,059,896 Euros.

The program includes funds for the completion of major investment in farms, processing units and processing agricultural products, investment in non-agricultural, tourism and the establishment of micro enterprises. To be an eligible investment made with EAFRD should be located in Romania, and by respecting the legislation, activities from the following economic areas could be done: production of agricultural plant and / or zoo technical and forestry, industrial processing, agricultural products and forestry.

However, although the National Program of Rural Development is intended as a continuation of the SAPARD program a pre-accession instrument which addressed to the modernization and restructuring of agro-food sector, compared with the aforementioned PNDR a program that provides increased opportunities. Firstly, the funds allocated to rural development are higher the support forms are more diversified and there are several categories of beneficiaries. In the same direction the area of eligible investments is larger the flexibility is increased, and the procedures are simplified.

The stages of accessing the European Funds for Rural Development

So far for the nationally launched measures were submitted 13,338 projects in accordance with the published value of approximately EUR 5.062 billion, representing approximately 63.10% of the total amount allocated for Rural Development of Romania, for the period 2007-2013 (i.e. 67.30% if we relate to the remaining 7.522 billion euros for rural development by allocating the amount of 500 million euros for direct payments).

Ten sessions for selection were organized, which included a number of 6235 projects with a value of approximately 5 billion Euros. Since were selected for funding 2548 projects in amount to Euro 1.627 billion, representing approximately 21.6% of the net amount allocated, from which have contracted a total of 1794 projects with a public 918 million euros which represents approximately 12.2% of the net amount allocated. and was declared completed a number of 158 projects.

For the contracted projects were paid 620 claims for payment to a public Euro 56.9 million, plus payments for the 511 - Technical assistance worth 402,317 Euros and additional payments made by APIA (measure 611), in value of Euro 185,427,914, to reach to a total amount of payments of Euro 242,738,892, representing almost 3.23% of total net amount to our country by the European Union (the data being centralized in the Table 1).

At first glance it seems that Romania is, somehow, the stalemate in terms of accessing European funds for agriculture and rural development, because more than two years after accession and starting (theoretical) the implementation of PNDR, our country has not been able to access more than 3% of the amount allocated. However we should notice the large number of projects by providing a high potential for access to about 63% up to the present, which is well above the level recorded for SAPARD Program, located at 46% at 31 March 2006 (see Table 2).

Table 1 - The implementation stage of FEADR project, 31st of May 2009, (in Euro)

Measures	Conform filed projects		Selected for financing		Counteracted projects		Accomplished payments
	No.	Public value	No.	Public value	No.	Public value	Public value
112	661	13.778.466	-	-	-	-	-
121	3.581	983.537.829	1.287	384.230.202	786	176.909.544	51.321.418
123(2)	864	615.109.038	650	420.567.801	591	375.838.736	5.587.242
141	6.442	48.315.000	-	-	-	-	-
142	3	91.712	3	91.712	-	-	-
312	144	22.384.315	114	18.277.420	90	13.771.517	-
313	273	49.415.762	222	43.308.595	200	37.200.245	-
322	1.370	3.329.349.932	272	760.742.189	127	313.881.634	-
Total	13.338	5.061.982.053	2.548 (1)	1.627.217.919	1.794	917.601.676	56.908.660
511							402.317
211(3)							44.916.816
611(3)							140.511.098
Total payments from PNDR							**242.738.892**

Source: Ministry of Agriculture, Forestry and Rural Development
(1): Results obtained by selecting a number of 6235 projects;
(2): Includes support schemes state XS13 and XS28.
(3): The 211 - Amount 40822201.546 € (corresponding to a payment of 202,041) was applied in addition to APIA and then returned to MAFRD.

Measure 611 - The amount reported for the first payment of the value contribution of the EU and from the state budget. To this is charged to pay only the EU, paid through APDRP.

It is noted that the progress in accessing European funds for agriculture and rural development is due, in part, to a pre-accession program (SAPARD), and on the other hand, to the consultancy firms experience of our country in developing and implementing projects with European funding. Not the same thing we can say about the other operational programs that have problems in accessing these funds, the levels of access being located to less than 5% of the amounts allocated.

Table 2 – The evaluation of the absorbency degree of SAPARD Funds in Romania by the 31st of March 2006 (million Euros)

Objectives for development	Allocated amounts	Engaged amounts	The engaged degree (%)	Payments	The degree of absorbency (%)
1.1. Improving the processing and marketing of agricultural and fisheries products	676,8	385,6	56,97	175,5	25,93
1.2. Improving the structures for quality, veterinary and phyto sanitary control of product quality	48,0	0	0	0	0*
2.1. Rural infrastructure development	534,3	480,8	89,98	378,3	70,8
3.1. Investments in agricultural enterprises	496,5	162,5	32,72	86,1	17,33
3.2.Forming groups of producers	12,9	0	0	0	0*
3.3. Agricultural production methods projected to protect and maintain the environment	38,7	0	0	0	0*
3.4. The development and diversification of economical activities in order to generate incomes and multiple activities	300,3	69,8	23,25	18,9	6.28
3.5. Silvi culture	247,9	0	0	0	0*
4.1. Improving the professional training	20,9	6,1	29,36	0	0
4.2. Technical assistance	7,9	2,5	31,92	1,5	18,36
TOTAL	2384,2	1107,3	46,44	660,3	27,7

Source: Data collected from the Ministry of Agriculture, Forestry and Rural Development

Given that the rate of submission the projects to potential investors and is maintained in the following period, we can say that Romania will not have problems in accessing European funds for agriculture and rural development funds that will contribute to sustainable and balanced development of the rural area.

Conclusions

In conclusion, we can say that Romania is the beneficiary of a generous financial scenario for Agriculture and Rural Development (and not only), the allocated amounts being over 11 million Euro, representing approximately 35% of the total EU funds allocated to our country for the period 2007-2013 (at about 32 billion euros). It is however very important to follow the allocation and efficient use of these funds to ensure a sustainable balanced development of the Romanian rural space.

For this, we need all the efforts of the persons responsible for managing EU funds, both public authorities who coordinate the programs operational and business advisory, and recipients of funds.

In this sense, the public authorities responsible for managing European funds are designed to ensure the fair distribution of these funds to contribute to balanced development of the rural areas and to pursue their efficiency. The consulting firms need to fundament with the highest responsibility the projects for investments in order to increase the success of their projects and beneficiaries (investors in rural areas), to consider carefully the maximum opportunity to carry out investments, to help increase efficiency and to raise living standards in rural areas.

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TERRITORIAL AND NATURAL PRIORITIES OF MACEDONIA - IMPORTANT FACTOR FOR TOBACCO PRODUCTION DEVELOPMENT

Romina Kabranova[1], Zlatko Arsov

Abstract

Territory and natural conditions in Macedonia are well known in the World market of high quality production of oriental type of tobacco. Production of oriental tobacco at such a small territory is insignificant towards other producers (Bulgaria, Turkey), buy it is very important for Macedonian economy. The high value of exported tobacco and other tobacco products is regularly above 100 million USD (113 million USD for 2006 and 106 million USD for 2007). As a family production with low grade of mechanized labor processes, it provides survival of more than 100 000 residents of Macedonia. These reasons are enough to evaluate the importance of tobacco for a country with a gross national income per capita of around $4,120 in 2008, (GNI, Atlas method) and high unemployment rate (over 35%).

Natural resources for oriental tobacco production are relatively adequate for the most of the countries from Mediterranean region as well as Balkan Peninsula. However, the specific climate and soil conditions in Macedonia have a high comparative value for oriental tobacco. They enabled the tobacco to have definite value above all other crops from Macedonia, especially in areas limited with water resources and soil with low percentage of humus.

High level of tobacco production in the previous period has resulted with building of many huge industrial capacities, warehouses for final processing as well as three factories for cigarette production. They have been all build for the great domestic market (for over twenty million people of Former Yugoslav Republic) and partly for export. Nowadays, these capacities insufficiently are used with annual production of over 5,500 t of cigarettes.

Because of inadequate agrarian policy, tobacco production stagnates in the period of long transition and shows a high instability through the years. Therefore, the advantages of Macedonian region remain inadequately used. Macedonian region is characterized with arid climate, because the annual rainfalls are 742 mm/m² (average of 25 years), and the average of the last 10 years is only 582 mm/m² (schedule of the rainfalls is quite unfavorable). The biggest part of the oriental tobacco production is designed for export to the most famous markets (EU, USA, Japan, etc.), because the unprocessed tobacco has a high quality. Specific physical-chemical characteristics make Macedonian tobacco a component of the blend used for large number of the World's famous tobacco brands of cigarettes. Considering as competitive product in the World market, many countries are interested in buying Macedonian tobacco (EU, SAD, Japan etc.).

Key words: oriental tobacco, production, natural conditions, quality, export, competitive product

Introduction

The Republic of Macedonia is situated in the central part of the Balkan Peninsula (Southeastern Europe) covering an area of 25.713 square kilometers. Serbia and Kosovo to the North, Bulgaria

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to the East, Greece to the South and Albania to the West border the country. It is a major transit way for shipment of goods from Greece, through the Balkans, towards Eastern, Western and Central Europe and through Bulgaria to the East. It is a small country not just by size, also according population (2022547 inhabitants; Census data of population, households and dwellings in the Republic of Macedonia, 2002), but has propitious conditions for agriculture and is nearly self-sufficient in food production. The great biodiversity, climate, soil and water recourses enable growing broad assortment of crops in agriculture. About 40% of the population lives in rural areas. The country's agriculture dominated by small and highly fragmented family farms. Agricultural export is consisting mostly of tobacco and tobacco products and wine, grapes, fruit, early-market garden vegetables and lambs. The main trading partners are the EU, Serbia and Montenegro.

For Macedonia, production of tobacco is very important. Not only it is manage to be grown in relatively low productive soils with limited potential for other concurrent production, it also assure a large number of families (annual average 25.000[2]) who have made contract with companies for purchase of tobacco. Existence of large number of capacities for processing tobacco, and three factories for cigarettes is buffer for the high rate of unemployment in the country (over 35 %). Furthermore, there are even more employees in other tobacco-related activities, like transportation, storage, trade and cigarette manufacturing (over 4000 employees).

Foreign direct investments of USD 6, 6 million have been made in the tobacco industry between 1996 and 2002. Within total industrial production of the country, tobacco participates by 3,9 %. It also participates with more than 1/3 of the total agricultural export, food and processing industry.
Because of significance of this crop, the state provides 16, 0 % from fiscal money for support of agriculture in Macedonia to tobacco production.

Macedonia produces 0,3 % of total tobacco production in the world and 3 % of oriental tobacco production in the world. Convenience of the territory enable production (average production over 20.000 tons) which is far more than domestic consumption; 90 % from the annual production is set to be exported.

Material and working methods

It this paper have been used the statistical data from the State Statistics Office of Macedonia, the analyses from the Ministry of Agriculture, Forestry and Water Economy in the Republic of Macedonia official data from the Hydro-meteorological Institute in Macedonia as well as publish annual reports from the Economic Chamber of Macedonia.

Among data processing and making conclusions, general methods have been used for this kind of research. Thereat, mainly the comparative analytical method has been used (natural and financial parameters, searching the movement of official statistical data about production, processing, purchase prices and export).

Certain correlations between meteorological conditions have been made, as well as events in the tobacco production and utilization of natural resources that gives Macedonia (the last three years). The analyses of the assortment have been made to notice the structure of different types of oriental tobacco in the country and variation in tobacco production and the yield.

2 Based on calculation made by number of producers contracts

Geographical position:

Macedonia is located in Southern Europe, between 40^0 50' and 42^0 20' northern latitude and 20^0 27' and 23^0 0.5' eastern longitude. The relief structure is quite developed and diverse. It consists of mountains, hills, plateaus, ravines, river valleys and other smaller relief forms. The territory belongs to two geographical entities: the Rodopians and the Sara Mountain area. On the other hand, the Rodopian Mountains are divided into three geographical entities: East Vardar group of mountains and ravines, the low part of Macedonia (Povardarie) and Western Vardar group of mountains and valleys.

Climate conditions:

Due to the geographical position and relief, the territory of Macedonia is under the strong influence of several types of climate: the Mediteranian climate penetrates from the South and West, the western winds pervade from the West, while the continental climate enters from the North and Northeast. As a result, the territory of Republic of Macedonia has three different types of climate: altered Mediteranian, Mountain and moderate-continental climate. Macedonian climate features hot summers and cold winters. Fall tends to be dry in the country. In July, the average temperature is between 20 and 23° C. The average temperature in January is between –20 and 0° C. Snowfalls can be heavy in winter. As optimal temperatures for growing oriental tobacco it is believed that are 16, 8 Cº (average in May) and the highest 23, 8 Cº (average in August). According to Bailov, 1965, the optimal temperature for growing and maturation tobacco is from 20 Cº to 23 Cº. The period between 2006 and 2008 shows that mean monthly air temperatures in Macedonia are adequate for oriental tobacco 18, 2 Cº (average in May) 22, 7 Cº (average in August).

Table - 1 Mean monthly air temperature, Cº

Year	Months												
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Annual Value
2006	1,0	1,4	7,6	13,5	17,9	21,4	23,7	23,6	19,3	14,0	6,1	2,5	12,5
2007	5,0	6,1	9,4	14,0	18,7	24,1	27,6	25,2	17,7	12,8	4,4	1,0	13,8
2008	1,7	5,2	9,2	13,5	17,8	22,6	24,0	25,9	17,5	14,1	7,6	3,4	13,5

Meteorological data for central part of Macedonia

Recent data indicates that in the last few years rainfalls have decreased, especially during growing period in the year 2007 (from May until October). As a result, there have been shortages of water (Table 2).

Table - 2 Monthly amounts of precipitataions, mm

Year	Months												
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Annual Value
2006	46,0	53,9	46,3	18,7	14,1	46,8	56,6	38,8	39,2	73,8	22,5	13,6	470,3
2007	35,7	31,4	38,8	13,2	75,7	48,8	0,0	45,0	24,5	141,4	59,5	26,7	540,7
2008	4,2	1,7	18,3	46,4	55,6	23,8	48,0	12,2	91,4	23,6	51,3	48,6	425,1

Meteorological data for central part of Macedonia

The low water level brings about droughts, which was the main reason why in the past three years (2006, 2007 and 2008) there was an inopportune period for tobacco growers in Macedonia. Also,

irrational access of water resources contributes by decreasing the yield per hectare.

Irrigation of oriental tobacco depend on weather conditions through of the year, type of the soil, variety of tobacco and stage of the plant for the duration of growing period. Every water delay or overflow is for sure deterioration of the quality that has high impact on aromatic complex of oriental tobacco.
The opposite, rational irrigation, water interventions during extremely dry year is going to reduce growing period of the plant and will achieve positive rate in correlation: a higher yield on side and improved quality on the other side.

Soil Conditions:

The structure of Macedonian land is very heterogeneous taking into consideration the small space of territory where many different types of soils exist. Oriental tobacco have been grown at soil with low quality (depend on different areas in the Macedonian territory). Regarding to types *Jaka, Prilep*, and *Basmak* they succeed on low solvency soil, such as dilluvial type of soil.

Hidrography:

Waters are approximately 2% of the territory of Macedonia. There are about 35 rivers and 53 natural and artificial lakes. In relations to quantities of water resources, Macedonia belongs to areas that have sufficient water resources. However, their distribution is quite unequal. The average quantity of water is 6.63 billion m^3, water that flows into the basins of the following rivers: Vardar (4.77 billion m^3), Strumica (0.18 billion m^3) and Crn Drim (1.68 billion m^3). The water level of the rivers is high in spring, autumn, and low in summer.

Characteristics of Macedonian tobacco

Oriental type of tobacco for Macedonia means synonym for top quality, because of its physical, chemical and technological characteristics. It is competitive tobacco, famous and persistent component of the blend for a large number of the world's famous tobacco brands of cigarettes. The World bayers of Macedonian tobacco are Philip Morris, Beatte, Japan Tobacco etc.

Speaking of quality means specific caracteristics of specific type of tobaco. Oriental type of tobacco means specific phisics caracteristics (dimension up to 18 cm, colour, and texture of the leaves), specific chemical caracteristics (percentage of nicotine, content of soluble sugar) aroma, taste, etc. Tobacco has to be material with specific quality according to the demands of tobacco industry and the final product has to satisfy the final consumers, the smokers. Oriental type of tobacco has special needs such as relatively high temperature all along the growing period and relatively low air humidity. They have been grown also at soil with low quality. In the structure of tobacco production in Macedonia, oriental types of tobacco are prevailing, from which *Prilep; Jaka* and *Basmak* are the most popular among producers and buyers.

As a result of the continuous changes provoked by the biggest world's tobacco industries that need less but the highest quality oriental tobacco for production different types of cigarettes, Macedonia is still, country number one in this region of production such a type of tobacco.

Dinamic of tobacco production and cultivated areas under tobacco

Growing tobacco in Macedonia is specific process with a long tradition in all tobacco productive regions in Macedonia. Although tobacco seedlings production, growing tobacco in the field, as well as drying and primary manipulation of tobacco make to be one of the most labor intensive plants, over than 25 000 households exist only producing tobacco.

While it is still in the nursery, tobacco starts with improvement of yield and quality. Because

of that, a special attention is needed for implementing new technologies in tobacco seedlings production, using tobacco certificated seed from accredited institution (Tobacco Institute in Prilep), implementation of new varieties of tobacco which are already recognized and proved (indigenous or acclimated varieties) with high yield and high quality of tobacco. All these activities will ensure placement of Macedonian tobacco Worldwide.

Increasing the tobacco production does not mean to increase the total area of production, but to keep the present and get higher yield per hectar. This is possible only by using the best agricultural practice.

Table 3 - Dinamic of production of raw tobacco and cultivated areas under tobacco

Year	Planted area, hectares	Production of raw tobacco, tons	Yield kg/ha
2006	17 438	25 036	1 436
2007	17 132	22 056	1 287
2008	17 185	25 365	1 476

Source: State Satistical Office of Macedonia, Agriculture Bulletin - 2006, 2007, Economic Chamber of Macedonia, 2008.

The largest production is concentrated in Pelagonia region (7,150.00 ha), and Southeastern region (3,492.00 ha), where oriental tobacco with exceptional quality have been produced and controlled by the experts from tobacco companies in the country as well as the oldest institution: The Faculty of Agricultural Sciences and Food in Skopje, and the largest and famous Tobacco Institute in Prilep.

Nowadays, practically every single type of tobacco could grow in any region of the country (in the past there were strict restrictions). Largely, type *Prilep* is produced in Pelagonia region and Vardar Valley, down from Veles and type *Jaka* is mostly cultivated in the east part of the country. Type *Jebel* used to be grown in the area of Skopje, Kumanovo and Tetovo (these years it has been reduced).

The only type, which is cultivated in every region, is type *Basmak*. It is efficient even where type *Prilep* gives week results and low quality.

Table 4 - Purchased oriental tobacco / 000 kg; Crop 2006

Share of classes	TYPE				
	Prilep	***Jaka***	***Jebel***	***Basmak***	Total
I	727,0	540,6	-	122,3	1.389,9
II	4.166,2	1.751,8	-	639,6	6.557,6
IIa	4.409,6	1.720,9	-	553,9	6.684,4
IIIb	1.588,2	732,9	-	241,3	2.562,4
IV	705,5	277,2	-	85,2	1.067,9
V	135,1	22,7	-	9,3	167,1
Oriental Total	**11.731,6**	**5.046,1**	**-**	**1.651,6**	**18.429,0**
Total 100%	63,7 %	27,3 %	0,0 %	9,0 %	100 %
Average purchase price den/kg	**113**	**120**	**-**	**156**	

- *Jebel* not purchesed in 2006

Table 5 - Purchased oriental tobacco / 000 kg; Crop 2007

Share of classes	TYPE				
	Prilep	***Jaka***	***Jebel***	***Basmak***	Total
I	535,7	473,1	7,2	196,8	1.212,8
II	5.997,0	2.228,4	50,4	1.020,9	9.296,7
IIa	3.238,9	1.305,4	25,9	571,7	5.141,9
IIIb	285,9	165,3	2,4	116,8	570,4
IV	15,7	12,5	184.5	13,4	226,1
V	2,6	1,1	0.0	0,8	4,5
Oriental Total	**10.075,8**	**4.185,8**	**270,4**	**1.920,0**	**16.452,0**
Total 100%	61,3 %	25,4 %	1,5 %	11,8 %	100 %
Average purchase price den/kg	**132**	**145**	**144**	**178**	

Table 6 - Purchased oriental tobacco / 000 kg; Crop 2008

Share of classes	TYPE				
	Prilep	***Jaka***	***Jebel***	***Basmak***	Total
I	2.931,6	1.638,0	9,1	380,6	4.959,2
II	4.710,8	1.957,8	27,9	1.504,1	8.200,6
IIa	1.349,2	800,0	9,2	585,0	2.743,4
IIIb	63,1	64,4	0,5	73,5	201,5
IV	5,6	4,6	0,0	5,9	16,1
V	0,9	0,9	0,0	0,4	2,2
Oriental Total	**9.061,2**	**4.465,7**	**46,7**	**2.549,5**	**16.123,0**
Total 100%	56,2 %	27,7 %	0,3 %	15,8 %	100 %
Average purchase price den/kg	**159**	**169**	**166**	**193**	

It is obviously that the prominent type *Prilep* participate in total production of oriental tobacco (over 60%), type *Jaka* follows (about 30%). The recent years, type *Basmak* replaced some of cultivated areas, because of a high demand for this type from foreign tobacco buyers. The production has been almost double in the past tree years (from 9% in 2006 up to 15% in 2008). Type *Basmak* has a tendency to become eminent type in tobacco production in Macedonia as well as type *Prilep.*

Oriental type of tobacco is with high rate of cigarettes produced of a kilogram of tobacco, which also depend on variety, agro-technical measures through the growing period, where the moment of technological ripeness of tobacco and process after picking up tobacco leaves from the field is very important.

Conclusion

- The influence of geographic position, climate and all other natural conditions enable Macedonia to have rich assortment of agricultural crops. One of them is the most famous tobacco with special meaning for Macedonian economy in development.
- The tradition of growing oriental tobacco, as well as built infrastructure, as well as the support from the Government, could contribute the production of about 30 000 tons per year. The World market has a need from such a type of tobacco with specific chemical characteristic and significant flavor, as complement of the World famous brands of cigarettes.
- Nowadays, the production of tobacco do not shows sufficient exploitation of all above-mentioned possibilities, so it is very unstable through the past years.
- Although the Government made efforts and supported the tobacco production with higher subvention, there is instability in tobacco production. Major reason is continuous drought in the last years that reduce the yield per hectare as well as total production of tobacco.
- Different regional characteristics in Macedonia manage production of the following types of oriental tobacco: Type *Prilep* in the biggest Pelagonia region; type *Jaka*, in particular in the Southeastern region; both types consist over 90% from total production of oriental tobacco in the country.
- Type *Basmak* has tendency to spread up in the near future because of the high demand from foreign buyers.
- The value of produced tobacco and its potentiality for export, (it is 90% from total production) depend on high rate of cigarettes produced of a kilogram of tobacco by classes, which has been established from the specific valuation when it is trade. The participation of upper classes and purchase price is high and their participation in export is 100%.
- The influence of meteorological conditions on high rate of cigarettes produced of a kilogram of tobacco is significant, so in 2007 it was relatively promising with higher participation of I, II and II A class in contrast with the year 2006 and 2008.
- The territory of Macedonia is favorable for production of tobacco, especially oriental type. Nevertheless, eventual campaign against smoking could possibly reduce the world's demand for oriental tobacco. Therefore, the same tobacco could be grown for fuel (the seed of tobacco consist over 40% of oil). Because of that, the production of tobacco in Macedonia cannot be threatened for a long time.

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THE INTERDEPENDENCE BETWEEN AGRICULTURE AND CLIMATE CHANGE - A EUROPEAN PERSPECTIVE

Mirela Matei[1], Adrian Stancu[2], Predrag Vuković[3]

Abstract

Global climate changes are taking place and its impacts on economy are already occurring in fields like tourism, agriculture, forestry, infrastructure, insurance industry or capital market. Specialists draw attention that climate change has negative effects and positive effects. For example, in some parts of Europe, especially in north, the agricultural may benefit from temperature rise increasing carbon dioxide levels in the atmosphere. The most important part of these changes is due to greenhouse gas (GHG) emissions from human activity. Between greenhouse gases, carbon dioxide (CO_2) is the largest contributor with a weight around of 80 % of total GHG emissions.

The agriculture is the most affected sector by the climate change, but agricultural activities have many implications on environment through emissions of methane and nitrous oxide that result from changes in land use and agricultural production or through the production of bio fuels.

Key words: climate change, agriculture, greenhouse gas

Climate change – an economic, social and political challenge

The climate change is a complex phenomenon with many implication in economic, social and political life, because it has effects on agriculture; water resources, water supply and water quality; on energy use, ecosystems, human health and impacts of sea level rise or from drought; flooding; storm damage and extreme weather (including costs to infrastructure) etc. In Europe, there are available some statistics that demonstrate the huge economic impact of climate change, for example:

- Since 1980 until 2004, 64% of catastrophic events are directly correlated to weather and climate extremes;
- In the hot dry summer of 2003, a loss of 10% of glacier mass in the Alps had been registered;
- In Spain, the droughts of 1999 caused losses over euro 3 billion;
- In northern Europe, in period of 1990-2000, the annual precipitation has increased by 10-40% with high implications on flooding an landslides;
- The economic annual losses from climate events increase in the last 20 years from USD 5 billion to USD 11 billion;
- Climate extreme events have causes 82% of death determined by catastrophic events;
- Climate extremes are responsible for 79% of economic losses caused by catastrophic events.

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The main manifestations of climate change are the temperature's increase and the rise of sea level. The global warming is due, to some extend, to natural factors, but the most important determinant is the human activity through the emission of greenhouse gas. The climate change has many effects on economic and social life, because it affects human health, natural ecosystems, biodiversity etc.

The specialist are not concerned only in the past climate change impact but also in projected climate change impacts. Some climate changes like higher CO_2 concentrations, higher temperatures, sea level rise, storms, floods, droughts will have multiple concequences:

- The increase in tick borne diseased caused by the rise of temperature;
- The increase of vulnerability in insurance industry due to the increase in intensity and frequency of climate change events;
- The agricultural area will expand northwards, in long terms;
- The increase of CO_2 concentrations and the rise of temperatures will have a positive impacts on European agriculture;
- The rise of sea level will determine flooding and costal erosion;
- The increased crop yield in northern areas and the cut of s crop yield in hotter and dryer regions from Europe.

For these reasons, at international level, there are scientific and political concerns regarding the climate change and the measures that have to adopt in order to limit these climate problems. The efforts made at international and regional level are important. The main results is the conclusion of Kyoto Protocol, under the United Nations Framework Convention on Climate Change, that sets binding emission targets for a basket of six GHGs. The European Union is highly implicated in international negotiations in order to support the meet of Kyoto commitments. In addition, on European continent, we remark the adoption of national programs in order to reduce the GHGs emission. The results of these efforts can be observed in the table 1; the figures available for countries from European Union demonstrate the commitment of European authorities in order to respect the protocols and agreements signed.

Table 1 - Emissions of greenhouse gases in the European Union countries

	Emissions of carbon dioxide (million tones)		Emissions of carbon monoxide (million tones)		Emissions of methane (million tones)		Emissions of sulphur oxides (million tones of SO_2 equivalent)		Emissions of nitrogen oxides (million tones of NO_2 equivalent)	
Year	**1995**	**2005**	**1995**	**2005**	**1995**	**2005**	**1995**	**2005**	**1995**	**2005**
EU-27	4,165.2	4,269.0	51.08	31.89	25.73	19.94	17.16	8.28	14.60	11.29
Belgium	123.7	123.3	1.11	0.88	0.51	0.37	0.26	0.15	0.37	0.29
Bulgaria	65.9	54.8	0.85	0.74	0.71	0.49	1.48	0.90	0.27	0.23
Czech Republic	132.1	125.9	1.00	0.51	0.64	0.52	1.09	0.22	0.37	0.28
Denmark	60.5	50.4	0.71	0.61	0.28	0.27	0.14	0.02	0.26	0.19
Germany	921.2	872.9	6.53	4.03	3.88	2.27	1.73	0.56	2.17	1.44
Estonia	20.1	18.0	0.21	0.16	0.10	0.09	0.12	0.08	0.04	0.03
Ireland	35.5	47.3	0.32	0.23	0.65	0.62	0.16	0.07	0.12	0.12

Greece	87.4	111.7	1.32	*0.64*	0.44	*0.40*	0.54	*0.53*	0.32	*0.32*
Spain	255.6	368.3	3.22	*2.38*	1.46	*1.77*	1.81	*1.36*	1.33	*1.53*
France	390.1	412.5	9.57	5.68	3.30	2.68	0.97	0.47	1.65	1.21
Italy	445.7	493.4	7.17	*4.21*	2.10	*1.91*	1.32	*0.50*	1.81	*1.17*
Cyprus	5.6	7.8	0.10	0.04	0.04	0.05	0.04	0.04	0.02	0.02
Latvia	9.1	7.6	0.32	0.34	0.10	0.09	0.05	0.00	0.04	0.04
Lithuania	15.0	14.2	0.29	0.19	0.18	0.16	0.09	0.04	0.07	0.06
Luxembourg	9.2	11.9	0.11	*0.04*	0.02	*0.02*	0.01	*0.00*	0.02	*0.01*
Hungary	61.9	61.8	0.76	0.59	0.39	0.37	0.70	0.13	0.19	0.20
Malta	2.3	*3.0*	:	:	*0.02*	0.02	*0.03*	0.02	*0.01*	0.01
Netherlands	170.6	175.9	0.86	0.60	1.13	0.80	0.13	0.06	0.47	0.34
Austria	63.7	79.7	1.01	0.72	0.41	0.34	0.05	0.03	0.19	0.23
Poland	377.5	326.5	4.55	3.33	2.04	1.82	2.38	1.22	1.12	0.81
Portugal	53.1	67.9	0.85	0.65	0.59	0.53	0.33	0.21	0.27	0.28
Romania	134.8	110.5	*2.09*	1.41	*1.49*	1.23	*0.89*	0.73	*0.32*	0.31
Slovenia	14.9	16.7	0.09	0.08	0.10	0.10	0.13	0.04	0.07	0.06
Slovakia	43.8	39.9	0.42	0.30	0.23	0.20	0.25	0.09	0.18	0.10
Finland	58.2	57.0	0.44	0.52	0.29	0.21	0.10	0.07	0.26	0.18
Sweden	58.0	52.6	0.90	0.60	0.32	0.27	0.07	0.04	0.28	0.20
United Kingdom	549.8	557.6	6.30	2.42	4.30	2.36	2.32	0.71	2.38	1.63

Source: Eurostat, 2009

The impact of economic activities on the emission of GHGs is not the same in all the countries from the European Union. The „contribution" of each country depends on the structure of economy and the dynamics of this structure taking in account the importance of sectors to the production of GHG.

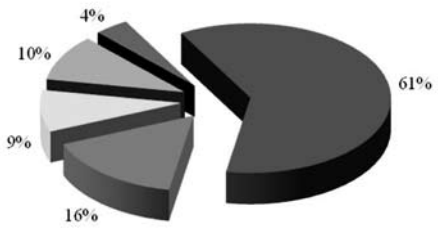

Figure 1. Greenhouse gas emissions by sector, EU-15, 1990 (based on data in million tones CO_2 equivalent)

Source: Adapted from Eurostat, 2009

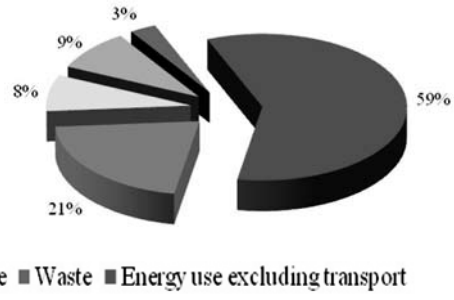

Figure 2. Greenhouse gas emissions by sector, EU-15, 2005 (based on data in million tones CO_2 equivalent)

Source: Adapted from Eurostat, 2009

If the emissions of greenhouse gases presented in table 1 are converted in emissions of carbon dioxide (table 2), we observed that the most important emissions belongs to developed countries from European Union like Germany, France, Italy and United Kingdom. So, we could say that the emission of GHGs is an indicator of development. In the top presented above, two new members of the European Union are presented due to their industrial development.

Table 2 - Weighted emissions of greenhouse gases (million tones of CO_2 equivalent)

	1995	2000	2005	Share in EU-27 (%)
EU-27	5,249.4	5,099.7	5,176.9	-
Germany	1,095.7	1,019.8	1,001.5	19.3
Spain	318.4	384.4	440.6	8.5
France	558.9	559.7	553.4	10.7
Italy	532.5	553.8	582.2	11.2
Netherlands	225.1	214.4	212.1	4.1
Poland	453.2	405.1	399.0	7.7
Romania	187.0	138.6	153.7	3.0
United Kingdom	710.1	674.0	657.4	12.7

Source: Eurostat, 2009

If we analyze the emission of carbon monoxide and carbon dioxide per capita, the situation is different, the first places being occupied by small countries, many of them being new members of the European Union. *This fact demonstrates that these countries use pollutant installations and equipments and they do not make important steps in order to meet environment's standards.*

Table 3 - Emission of carbon monoxide and carbon dioxide in EU countries (kg per capita)

Rank	Emissions of carbon monoxide	kg per capita	Rank	Emissions of carbon dioxide	kg per capita
	EU-27	**65.0**		**EU-27**	**8,696**
1	Latvia	147.4	1	Luxembourg	26,088
2	Estonia	118.7	2	Estonia	13,358
3	Denmark	112.7	3	Czech Republic	12,321
4	Finland	99.3	4	Belgium	11,807
5	Bulgaria	95.3	5	Ireland	11,508
6	France	90.9	6	Finland	10,887
7	Luxembourg	87.9	7	Netherlands	10,788
8	Austria	87.7	8	Germany	10,581
9	Poland	87.2	9	Cyprus	10,398
10	Belgium	84.2	10	Greece	10,076
11	Italy	72.0	11	Austria	9,706
12	Sweden	66.6	12	Denmark	9,319
13	Romania	65.1	13	United Kingdom	9,283
14	Portugal	61.7	14	Spain	8,557
15	Hungary	58.4	15	Poland	8,553
16	Greece	57.7	16	Italy	8,439
17	Ireland	56.0	17	Slovenia	8,345
18	Slovakia	55.7	18	Malta	7,500
19	Lithuania	55.5	19	Slovakia	7,417
20	Spain	55.3	20	Bulgaria	7,061
21	Cyprus	53.4	21	France	6,597
22	Czech Republic	49.9	22	Portugal	6,451
23	Germany	48.8	23	Hungary	6,121
24	United Kingdom	40.3	24	Sweden	5,834
25	Slovenia	40.0	25	Romania	5,103
26	Netherlands	36.8	26	Lithuania	4,134
27	Malta	NA	27	Latvia	3,282

Source: Eurostat, 2009

In European Union, a comprehensive energy and climate change package has been adopted in 2007. The European Council has committed to cut GHG emissions by at least 20% by 2020 compared with 1990 and adopted an „Energy Policy for Europe" in order to improve the use of energy, to increase the share of renewable energy to 20%, to reduce to carbon emissions. The main objective is the limitation of global temperature increase to 2 degrees Celsius above preindustrial levels by 2100.

At European Union level, the public authorities promote not only mitigation actions but also adaptation actions. The adaptations measures are promoted in order to cope with changing climate like higher temperatures, increased rainfalls; frequent storms etc. These adaptation actions may consist in the efficient use of scarce water, the selection of species less vulnerable to climate changes, the development of drought tolerant crops, construction of flood walls, the increase of dykes` levels against sea level rise, relocation of ports, For these reason, in 2007, the European Union has been adopted the Green Paper „Adapting to climate change in Europe – options for EU action" that examines climate change impact on Europe and propose and adaptation strategies that must be promoted by local and regional authorities. This process of adaptation has many consequences because it creates new jobs and markets for innovative products and services (CEC, Green Paper, p 10);

- The development of climate-proof building techniques and products and the set up of new markets for these merchandises;
- The change of time period of beach tourism in Mediterranean countries because the summers will be to hot;
- The growing season will lengthen in Nordic areas, so it is necessarily to adapt the local agricultural management practices;
- The financial sector will develope new instruments in order to reduce the risks due to climate change; in fact, on American continent, at Chicago Mercantile Exchange Group, futures and options contracts on weather are available for hedging and speculative strategies.

The connection between climate change and agriculture

The agriculture depends in a high extend by the climate, but other determinants like management practices, technological changes, market prices, policies related to subsidies or international trade patterns are important. For example, in the European Union, the agriculture crops are driven by the Common Agricultural Policy (CAP), that is an important instrument of European authorities. Even if the European authorities try to protect the local agricultural production from foreign competition, they must respect the conditions imposed by the World Trade Organization in order to liberalize the international commercial exchanges.

It is very difficult to determine the exact influence of the climate change of agriculture. In addition, the impact of climate change can have positive and negative effects on agriculture, and the extension of these effects is correlated with other factors. The temperature's increase affects the temporal and spatial distribution of precipitation and evaporation, and these phenomenons has direct impact on agriculture because water is crucial in food production.

At international level, over 80% agricultural land is rain-fed. In region like Australia or South America, the climate change has a huge impact on agricultural production taking in account the technical aspect like water evaporation and soil moisture distribution. In addition, available water resources for irrigation are important for agriculture.

The irrigated land represents at international level, around 18% of agricultural land, and its produces 1 billion tones of grain annually, that means half the world's total supply; (this situation is due to high yield of irrigated crops that is 2–3 times more than rain-fed lands (WMO, UNEP, IPCC 2008, pp. 59).

The European authorities consider that the agriculture is a victim of climate change and the European Economic and Social Committee is very concerned by the negative effects of this phenomenon on agriculture. (EESC 2008,pg 1). The most affected region is Southern Europe, because in this region, there are expected long periods of drought and water scarcity, and the worst predicted result is the total cessation of agricultural activity. This aspect has social implication because in Europe, the agriculture is an important source of employment.

The climate change affects agriculture, and agriculture affects climate change. Taking in consideration the IPCC definition, at international level, emissions of GHG from agriculture represent 10-12% of total emissions. In Europe, the share of agriculture in GHGs emission is estimated, by European Commission, around 9%. The impact of agriculture on CO_2 emission is small because the plants absorb this gas and transform it.

Speaking about GHG emission, the agriculture has negative effects on climate through emission of methane and nitrous oxide that result from changes in land use and agricultural production. In Europe, 40% of methane and nitrous oxide emissions are due to agricultural activities.

The main problem is that methane and nitrous oxide are stronger warming potential, about 23 and 296 times than CO_2. Another important problem is that there are many ways of methane and nitrous oxide emissions: conversion of woodlands and grasslands in arable lands; the use of nitrogen fertilizers; the decomposition of organic matter in soils, the existence of ruminant animals that is correlated with meat consumption.

Besides these negative effects, the agriculture has a contribution to prevention of climate change. One way is the production of bio energy (figure 3). The production of bioenergy will solve, in some extend, the problem of GHG's emissions and will create new jobs. In the European Union, the authorities try to direct the use of agriculture lands for bioenergy crops. In this way, the Common Agricultural Policy is adapted to new challenge of this time: environmental issues and climate change. In addition, all member states are encouraged to use biofuels in order to reduce the dependence on oil that is around 98% in the transport sector from Europe. This directive is important because according with The European Commission White Paper "European transport policy for 2010: time to decide", the CO_2 emissions from transport is expected to rise in the next years. The road transport is guilty of a huge share of the CO_2emission- around 90%), so, the promotion of Biofuels Directive is an important step in order to increase the use of these fuels through different instruments like tax exemption, financial assistance for the processing industry, the establishment of a compulsory rate of biofuels for oil companies.

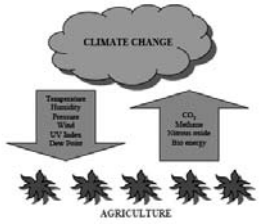

Figure 3 - The connection between climate change and agriculture

All these problems determined in agricultural sector by climate change has many implications, even in scientific field because researchers must develop new varieties of plants that are more adaptable to the new climate conditions: warm in north regions and aridity in south regions and that need small quantities of nitrogenous fertilizers in order to facilitate the control of GHG emissions.

Conclusions

The agriculture is most dependent economic sector by natural conditions and climate change. The climate change has direct and indirect effects on agriculture, and agriculture, in some extends, has negative impact on environment. In European Union, this challenge called climate change is a new issue for Common Agricultural Policy, The battle against climate change is tough and climate change is consider, by European authorities (EESC 2006, p. 8), the biggest challenge for Europe and all continents. The implication of public authorities is crucial because they must promote two types of measures: adaptation measures and mitigation measures. The citizens must be implicated in the process understanding climate change because this phenomenon affects different communities in many ways. So, educational, informational and training measures must be adopted.

At international, regional a national level, many agreements and protocols were concluded and many programs are running in order to maintain climate changes under control. The Kyoto Protocol is the most important measure at international level, and in Europe, the EU carbon dioxide Emission Trading Scheme (EU ETS) was adopted in order to reduce GHGs emissions.

In Europe, supply and use of energy is the most important source of GHGs emissions (80 %). Agriculture has a sectorial share around 9%. So, impact of agriculture on climate change is modest, but we remark the efforts made in EU in order to reduce the share of agriculture from 22% in 1990 to 9% in 2004. In this field, green house gases like nitrous oxide (N_2O) from soils, due to the use of mineral nitrogen fertilizers and methane (CH_4) from enteric fermentation, mainly from cattle, are guilty of climate change. So, agriculture is not a victim of climate change because it generates climate change.

The agriculture can have an important role in combating the climate change through bioenergy - energy from biomass. Biomass is the world's fourth largest energy source and it provides 10% of the energy used at international level. So, the use of bioenergy can have major economic and political consequences. For example, the replacement of imported fuels from Russia with bioenergy could contribute to ensuring the security of EU's energy supply.

In addition, biomass production is in a strong interdependence with environment. Cultivation, harvesting and collection of biomass and the use for heat, electricity and transport have consequences like soil erosion, emission of green house gas, and threats to biodiversity and water resources. So, bioenergy can have negative impact on environment and the main goal - reducing greenhouse gas emissions could not be achieved. Because of these interactions, we try to find the right way in order to use bioenergy and to reduce the emission of GHG's.

Taking in consideration the interdependence between climate change and agriculture, in the European Union, the authorities try to promote a new type of agriculture: climate-friendly agriculture.

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POSSIBILITIES FOR INCREMENT OF LIVE STOCK BREEDING COMPETITIVENESS ON THE TERRITORY OF BELGRADE CITY[1]

Lana Ivanović, Marko Jeločnik, Bojana Bekić[2]

Abstract

Belgrade, as administrative, economic and cultural centre of Republic of Serbia, covers total area of 3.224 km^2. From this area, 69,1% is agricultural land, which represents fundamental base for establishment of agricultural production. Live stock breeding, on the territory of Belgrade city, as well as in entire Republic of Serbia, is the most important branch of agriculture. On observed territory animal products' processing industry (dairies and slaughter houses) especially is developed. Because of that, increment of total live stock breeding production is of great importance for this territory.

For growth of live stock breeding competitiveness, in this paper work concrete activities are suggested, such as specialization and increment of production intensity, accomplishment of better financial conditions, selection, accomplishment of better primary agricultural products purchase, etc.

In this paper work also are considered and described necessary measures which have to be done by governmental institution, local communities, agro complex companies and family husbandries, with main goal to increase livestock breeding production competitiveness.

Key words: competitiveness, live stock breeding, Belgrade city, agriculture

Introduction

Live stock breeding production is of great importance for the territory of Republic of Serbia, as well as for the territory of Belgrade city. It mainly considers production of animal products which are being used in human alimentation (milk, meat, eggs). Beside that, live stock breeding has great importance as raw material resource for agro-food and processing industry (diaries, slaughter houses). Also, development of live stock breeding affects on development of associated agricultural industries, as fodder and animal medicaments production, machine and equipment industry, leather industry, etc.

Importance of live stock breeding comes from the fact that in Serbia small part of agricultural land is covered with irrigation systems, and that existing systems usually are used for irrigation of vegetable and fruit cultures. Because of that, for many agricultural husbandries, developed live stock breeding production is labelled as highly important, especially in years with unfavourable

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nature conditions for crop farming. Regarding this live stock breeding significantly affects on their business stabilization. However, lack of irrigation systems, limits development possibilities of live stock breeding production too.

Belgrade city area consists of 17 municipalities. It is partly located in lowland (Panonija lowland) and partly in highland areas of Šumadija. Northerly, above Danube and Sava rivers, is plain area in which is mostly organized crop production. Southerly, below Danube and Sava rivers, partly is plain and partly is hilly area. On that territory are organized both crop farming and fruit production.

Depending on natural conditions, structure of used agricultural areas, economic situation and local population structure, in some municipalities, in less, or high portion, certain animal production lines are developed. Although live stock breeding exists both in lowland area and in hilly area, municipalities with the biggest livestock funds are in lowland area, where are located the largest public and private companies from live stock breeding production branch.

State of live stock breeding production

Frequent prices oscillations (as of animal products, as of auxiliary goods), instability of agricultural products' markets, as well as general social, political and economic situation, have led to great fall of heads number of almost all animal spices in last fifteen years.

For perception of previous movement and present condition in livestock breeding production, as for creation of qualitative basement for projection of further live stock breeding production development, analysis of number of animal heads flow in period 1995-2007 is done. For better introspection into state and appropriate tendencies of this production, analysis of live stock fund considered territory of Republic of Serbia and territory of Belgrade city.

Inside of this analysis are observed number changes of cows, pigs, sheep and poultry, while it is not presented number of goats and horses, because importance of these live stock breeding branches in Serbia is mostly negligible.

First part of analysis considers territory of entire Republic and it shows that number of most important species and categories of animals was decreasing during observed period (Table 1). Number of cattle in 2007 in Serbia in compare with 1995 was fallen for 19,7%, while number of cows and breeding heifers were decreased for 22,69%.

In pig breeding, as in cattle breeding too, there was significant decrease of heads number. Total number of pigs decreased for 6,21%, and number of sows and gilts for 33,76%.

Total number of sheep was reduced for 13,28%, while number of breeder sheep reduced for 14,59%.

Comparing all live stock branches, the most decrement of head number was in poultry production, around 26,21%.

Table 1 – Changes of number of basic domestic animal species on the territory of Republic of Serbia, 1995-2007. (on the date of 15th of January)

Year	Cattle		Pig		Sheep		Poultry total
	Total	Cows and breeding heifers (in %)	Total	Sows and gilts (in %)	Total	Breeder ewe (in %)	
1995.	1.353.802	61,92	4.085.811	20,33	1.852.062	75,34	22.256.132
1996.	1.335.293	62,00	4.344.165	19,96	1.833.821	75,65	22.806.174
1997.	1.317.697	62,43	4.119.454	20,85	1.757.902	75,71	22.365.117
1998.	1.296.035	63,95	4.057.830	21,01	1.644.800	78,25	22.599.656
1999.	1.299.493	64,82	4.292.896	20,88	1.598.195	78,11	23.278.109
2000.	1.272.275	66,29	4.065.911	21,82	1.611.159	76,54	20.372.508
2001.	1.186.932	68,41	3.615.193	21,86	1.489.473	79,61	19.289.931
2002.	1.176.906	68,06	3.587.172	22,77	1.447.675	78,08	18.804.143
2003.	1.161.506	67,98	3.634.274	22,69	1.515.561	74,73	17.676.609
2004.	1.101.951	67,34	3.438.662	20,11	1.585.645	72,95	16.280.292
2005.	1.079.020	66,78	3.164.986	20,68	1.575.907	74,19	16.630.948
2006.	1.096.185	64,75	3.211.597	21,33	1.609.239	73,50	17.905.052
2006.**	1.105.988	60,98	3.998.927	15,54	1.555.864	75,03	16.595.204
2007.**	1.087.077	59,62	3.831.894	14,36	1.606.156	74,20	16.421.755

* In 1994. was not done regular registration of animals. ** State on 1st December.
Source: Statistical yearbook, Municipalities in Serbia for specified Year, Statistical institute of Republic of Serbia

Second part of analysis considers territory of Belgrade city. In distinction to Republic level, where is within all animal spices accomplished decrement of heads number, at the Belgrade city level in same period situation was better (Table 2). In that area came to reduction of cattle and pig heads number, while number of sheep and poultry showed rising tendency in observed period.

Number of cattle on the territory of Belgrade city in 2007 was decreased, comparing to 1995, for 33,05%. Reduction of cows and breeding heifers number was smaller, around 31,90%. Above mentioned shows that fall of cattle heads was more significant on Belgrade, than on the Republic level.

Total number of pigs also shows reduction tendency, herewith in observed period oscillations are more expressed. In 2007, comparing to 1995, number of pigs has fallen up to 4,63%, while number of sows and gilts even achieved fall of 36,30%.

From all underlined animal species, it comes to increase of sheep and poultry number. Total number of sheep is enlarged for 36,16%, while number of breeder sheep increased for 6,87%. In poultry production, which is presented in many husbandries, total number of heads, in analysed period, increased for 7,63%.

Goats and horses are bred on the territory of Belgrade city in really small number. They are explicitly held by individual agricultural husbandries, so similarly like on Republic level, they do not have higher economic importance.

Table 2 - Changes of number of basic domestic animal species on the territory of Belgrade city, 1995-2007. (on the date of 15th of January)

Year	Cattle		Pig		Sheep		Poultry total
	Total	Cows and breeding heifers (in %)	Total	Sows and gilts (in %)	Total	Breeder ewe (in %)	
1995.	83.671	58,56	246.880	22,81	49.275	77,50	912.504
1996.	83.205	59,38	263.721	21,30	49.996	78,09	1.065.915
1997.	86.153	56,94	253.447	22,37	45.578	79,20	1.065.382
1998.	80.458	58,96	256.971	21,99	45.983	82,08	1.118.914
1999.	81.746	58,75	272.127	21,24	47.371	81,28	1.104.706
2000.	79.092	59,52	280.866	21,64	50.234	77,90	1.095.455
2001.	70.201	59,67	245.186	21,37	48.038	80,10	1.070.077
2002.	68.504	59,10	273.426	20,15	48.612	77,95	1.059.835
2003.	68.615	59,97	273.721	20,11	52.458	68,65	963.228
2004.	64.922	62,13	237.115	21,14	63.142	66,93	1.115.024
2005.	62.991	58,27	190.227	23,49	62.292	65,07	1.000.554
2006.	62.708	56,07	205.521	20,53	62.746	70,30	1.042.232
2006.**	60.744	59,25	255.020	16,59	69.386	72,29	1.122.546
2007.**	56.016	59,57	235.452	15,24	67.092	60,83	982.095

* In 1994. was not done regular registration of animals. ** State on 1st December.
Source: Statistical yearbook, Municipalities in Serbia for specified Year, Statistical institute of Republic of Serbia

Institute for statistic and informatics of Belgrade city, collects data about certain live stock products connected to city territory. Momentarily available is data for 2006 and 2007. Based on that fact, similar data are presented for Republic level too (Table 3).

Production of cow milk, one of elementary provisions, decreased in this period for 2,4% on Republic, and for 3,1% on Belgrade city level. At other side, it came to increase of milk production per milked cow, on Republic level for 0,7% and on city level for 4,1%.

Production of sheep milk on City territory is done strictly at individual producers' husbandries. Development of total sheep production could be visible through the growth of sheep milk production. Also it came to increase of milk production per one sheep for 166,7%. On the territory of Republic, comparing to City territory, it is accomplished decrement of total milk production, as milk production per sheep too. From other sheep products, volume of sheared wool statistically was evidenced, at which increase of total production is accomplished, as on Republic, as on City level.

Average eggs production per layer in Belgrade increased for 27,5%, but it came to decrement of layers number, so total eggs production decreased for 24,8%. This big reduction of layers' flock is result of unfavourable ratio between prices of fodder and consume eggs. In Republic number of produced eggs has also decreased. Beside decrease in layers number, also smaller production per layer was accomplished.

Table 3 - Production of cow and sheep milk, eggs and wool, on the territory of Belgrade city and Republic of Serbia in 2006 and 2007.

Production	Republic of Serbia		Belgrade city	
	2006.	2007.	2006.	2007.
Production of cow milk, (000 l)	1.587.000	1.549.000	132.341	128.259
Average volume of milk per milked cow, l	2.645	2.663	4.145	4.317
Production of sheep milk, l	15.000.000	14.000.000	58.890	793.258
Average volume of milk per milked sheep, l	50	47	30	80
Wool production, kg	2.493.000	2.499.000	78.113	100.005
Average volume of wool per sheep, kg	1,9	1,9	1,75	1,88
Eggs production, (000 pcs)	1.456.000	1.364.000	143.558	107.927
Average eggs per layer	139	135	109	139

Resource: Statement 40/2008, city headquarters, Institute for informatics and statistic, Belgrade

As most important live stock breeding production, parallel in Republic and on territory of Belgrade city, cattle breeding is standing out. Last 15 years have seen changes into the cattle breeding types, which brings increased production per head. In cattle breeding production, husbandries which are oriented to milk production, usually have in possession cows of Holstein Frisian type, accomplishing production growth of milk per head in that way. Husbandries which have organized combined production, milk-meat type, retain ennobled domestic cattle of Simmental type, herewith they still are dealing with their further interbreeding with Simmental. As result of this kind of crossing it came to improvement of meat quality and higher growth per head.

According to data of Direction for veterinary medicine of Ministry of agriculture, forestry and water plant management, on Belgrade city territory (during 2008), in total number of cattle heads around 60% were heads of Simmental race, then about 35% of Holstein Frisian race, while other races (combined race, Hereford, etc.) were presented in little portion, around 5% of total cattle number.

Besides in cattle breeding, it came to significant changes of breeding types into the pig and sheep breeding too. In pig production individual producers have reacted to market demand introducing Pietren pig breed, whose main characteristic is lower content of fat into meat. Underlined change of breeding type was intensive in last few years, creating much more pigs of this breed or pigs interbread with this breed on the territory of Belgrade city and Serbia. But, having in mind that Direction for veterinary medicine of Ministry of agriculture, forestry and water plant management does not posses data about breeding types and pigs number on observed territory, it is impossible to define incidence of certain breeds.

If focus is on sheep breeding, more and more inter-crossing of domestic sheep race Pramenka with exported one, Virtemberg, has occurred, with the main aim in meat quality and volume production improvement. Besides this, flocks of sheep breed Ile-de-France are more often present on farms. They are used also for intensive crossing with domestic heads of sheep, in order to achieve better production characteristics.

Considering that agro-food industry, as one segment of animal products processing, is strongly developed just on the territory of Belgrade city, growth of total production of livestock breeding products on the observed territory would be much more significant, because it has great impact

on depreciation of transport costs and increment of production efficiency of companies in this sector.

At other side, non organized purchase and unstable prices, as on Belgrade city territory, as on area of whole Republic, affect in decrease of heads number, and represent one of the limitation factors for live stock breeding development.

Large concentration of consumers and nearness of the market have great importance, as for the sale of primary agricultural products of family farms to the processing industry, as for the sale of manufactured agricultural products, which are processed on local husbandries. This is especially expressed at sensible and easy damageable products, in other words products which do not bear longer transportation, as milk and some dairy products.

Having in mind incalculable importance of livestock breeding for development of whole agro complex, state of production base, and market potentials of the City, there is a big necessity to stop negative tendencies in live stock breeding production.

For restraining negative tendencies in live stock breeding, improvement in production competitiveness is needed. At first, it refers to cattle breeding production, as most important branch of livestock breeding production on the territory of Belgrade city. Having this aim in mind different measures can be applied.

Measures for improvement of lives stock breeding production

It could be underlined that the most important measures for improvement of live stock breeding production competitiveness are:

- Household enlargement;
- Establishment of modern facilities and equipment;
- Increment of production per head;
- Improvement of breeding types;
- Specialization;
- Arrangement of inputs and final live stock breeding products market;
- Better conditions for financing of live stock breeding production.

One of the fundamental problems in live stock breeding production is expressed fragmentation of land estates. By the measures of agricultural policy government should stimulate enlargement of husbandries, because it is known that it reflects in improvement of economic effects, which is precondition for development of all live stock breeding branches. Estates enlargement would be done, as in resizing of ground areas, as in increment of cattle's number on the farms.

Extremely high investments are needed for husbandries enlargement. Bigger part should be financed from subsidized credits, and smaller part from means of payment of individual producers. Having that fact in mind Ministry of agriculture produced set of measures for agricultural production financing, during 2009. This programme consists of:

1) subsidizing of interest at short term crediting of agricultural husbandries - for individuals;
2) long term credit financing of agricultural production and processing industry at agricultural husbandries - both companies and individuals.

Among long term credits, that have the utmost importance for husbandry enlargement, Ministry provides 40% of assets, and commercial banks provide 60% of assets among total financing sources. Effective interest rate for part of credit that is provided by commercial bank

is determined by bank itself according to its business policies. Interest rate can be six month EURIBOR +8% per annum at most. Interest rate is not accounted on part of assets financed by Ministry of agriculture, and intercalary interest is not charged.

Long term credits have grace period up to 12 months, unless they were granted for production of perennial plants, where grace period is set to be up to 3 years. Instalments for long term credits have to be paid within 5 years after grace period, unless for production of grape vine or core fruits, where deadline is set at 8 years.

Household enlargement in cattle breeding requires modernization of facilities and equipment used in direct production. For the purpose of increment of cattle, pig, sheep and poultry breeding competitiveness on the domestic and international market, production modernization through the building of new and refreshment of existing facilities, purchase of actual equipment and agricultural mechanization for fodder production, shoud be carried out.

For achieving increase of total production and production per head, adequate conditions for all live stock species accommodation should be secured. Besides influence on increase of produced quantum, this will also influence decrease of health protection and heads curing costs too. Accommodation facilities should be modernized, because they increase work efficiency, and decrease total financial investments. Additionally, purchasing of certain equipment and agricultural mechanization for crop production is also necessary.

Possibilities for cattle production growing have to be looked at first on individual husbandries. On experience from previous period, small farms besides all problems they are faced with, appear as really flexible, regarding to modernization of production processes. Most of larger husbandries, according the dairy plants requests, succeeded to improve milk quality, so they are delivering extra and first class milk.

Ministry of agriculture encourages milk production of certain quality with premium per delivered litre at 1,4 RSD in year 2009. It is important to say that premium is significantly lower compared to previous years, which has negative impact on family husbandries' business operations. Premium reduction was among all caused by decrease in available assets in state budget, which was greatly impacted by global economy crisis.

Increase of cow milk production should be based at first on larger milk production per head. To accomplish this aim, way of alimentation should be changed, in other words adequate meal for cattle nutrition mostly based on silage of whole maize plant has to be created. According to that, adjustment in sowing structure is necessary. On that way it will be influenced on decrease of alimentation costs and milk price.

Possibility for other live stock breeding productions development also has to be found in increase of production per head and in breeding of races which have better production characteristics. Appliance of selection measures, by importation of quality genetic material, as with increase of poultry farm size, should have influence on increment of yearly eggs production per layer and better quality of chicken meat. By stimulations from Agricultural budget, it has to be affected on growth of live stock breeding production volume.

Improvement of breeding types is also one of the conditions for achieving production increment per head. Depending on production area (lowland, hilly, or mountainous area) and present breeding type, necessities for pure breeds' importation or improvement of domestic types by using of artificial insemination occur.

Ministry of agriculture of Republic of Serbia has passed on legal act on usage of assets to support development of rural regions, through enhanced competitiveness of agriculture in 2009, by which incentive assets for obtaining quality breeding stock: breeding heifers, gilts, boars, goats and sheep up to 18 months old, poultry parent flocks, are determined. Incentive is 40% of value of obtained quality breeding stock (for marginal areas) or 30% (for other areas). This legal act also provides assets for obtaining mechanization for preparing and distributing of fodder at husbandry, then equipment for milking and storing milk, and equipment for distribution of manure. It represents yet another incentive for development of live stock production, and state participation is also 40% of price for marginal areas, and 30% of price for other areas. Among these things mentioned, legal act provides incentives for obtaining equipment for crop and vegetable farming, as for fruit growing and processing of certain agricultural products.

Improvement of breeding type would influence better fodder usage, decrease in slaughter waste, faster growth, etc.

Great problem is insufficient specialization of present production. Specialization of husbandries which are dealing with milk production can go into the two directions: 1) specialization on pure milk production; 2) directing on combined production, milk production and their own bullocks fattening. That way market nearness could be used for milk production, while bullock fattening would be directed, as to domestic market, to EU market as well. For correct specialization managing, support from state agro budget is necessary.

Redemption prices of live weight of all animal types are expressively unstable. Often price oscillations greatly affect decrease in producers' numbers, which are dealing with animal fattening, primarily pigs. Reason for frequent and big price changes in pig breeding is different way of pigs' alimentation, in other words using concentrated nutrients only. However, significant fodder price fluctuation affects in great portion on bullocks fattening and sheep production too.

Momentarily purchase of sheep and goat milk is not safe, and prices are unsatisfactory. Through building of small family capacities for processment of sheep and goat milk, it would be secured certain redemption and sale of raw milk and dairy products, and increment of these products prices.

For balancing live stock breeding production, it is necessary that government affects with agricultural policy measures on stabilization of crop cultures production quantum, which are used as fodder and on that way on stabilization of fodder prices and increase of live stock breeding production economy.

Together with collapse of textile industry problem of wool redemption appeared. Because wool purchasing practically does not exist, or purchasing prices are to low, sheep production efficiency has decreased. Revival of textile industry and handicraft, as production of wool products in rural areas, will enable employment of local population and increase in sheep numbers. Parallely, live stock breeding production value will grow too. Once wool products were much appreciated, but still big interest for clothes produced from natural materials in EU countries exists. Production of such goods would make improvement of sheep production possible.

Conclusion

Live stock fund and production volume on the territory of Belgrade city in the period 1995 - 2007 were in constant falling. For improvement in live stock breeding production in whole, at first development of cattle breeding production is necessary, as most important branch. Besides that, necessity for improvement of other branches of live stock breeding (pig, sheep and poultry breeding) is present, according to their development possibilities. Development of live stock breeding production and increase of animal products competitiveness could be accomplished by use of many measures, from which next are underlined: household enlargement, establishing of modern facilities and equipment, increment of production per head, arrangement of auxiliary goods and final animal products market, improvement of live stock breeding financing conditions, etc.

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POLAND'S ADJUSTMENT TO CHALLENGES OF CHANGING AGRICULTURAL POLICY OF THE EUROPEAN UNION

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Abstract

Paper is aimed in assessment of first period of Poland's membership in EU and covering agriculture and rural areas with the support under the Common Agricultural Policy in the context of future challenges faced by the agricultural policy. Analysis shows that accession to EU became a strong impulse for growth of the Polish food economy, however the main challenge for the Common Agricultural Policy in future, from Poland's perspective, will be strengthening the multifunctional agriculture, i.e. territorial cohesion and positive effects of agricultural activity on natural environment.

Key words: multifunctional agriculture, common agricultural policy, rural development, Poland

1. Introduction

During the recent decades, agriculture and food economy of the EU have revealed a high capability of adapting to the new economic, social and environmental challenges, resulting, *inter alia*, from transformations, occurring in technique and production technology, competition pressure and consumers' requirements. The mentioned adaptations had also place in the field of agricultural policy and public support, obtained via this policy. Owing to the mentioned adaptation, agri-food sector of the EU remains still the important sector of its economy although it is characterized by a very big diversity in the particular member states. At the same time, the discussed sector has a key meaning for environment and landscape of rural areas, preservation of natural habitats or counteracting the occurring climate changes.

Rural areas constitute about 91% of the EU-27 territory and are inhabited by almost 56% of the whole population. In Poland such regions represent 93.2% of Poland's total area. Those areas are inhabited by 14.7 million persons, i.e. 38.6% of the population [3]. Structural transformations in agriculture, as being forced by the changes in social - economic environment and technological progress in the agriculture alone are also supported by the CAP instruments. At the same time, CAP due to the contradictions contained in its instruments, inhibits the rate of the discussed transformations.

The aim of the paper is assessment of first 5 year period of covering Poland's agriculture and rural areas with the support under the Common Agricultural Policy in the context of future challenges faced by the agricultural policy. Analysis shows that accession to EU became a strong impulse for growth of the Polish food economy, however the main challenge for the Common Agricultural Policy in future, from Poland's perspective is support for the development of multifunctional agriculture.

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2. Changing role of agriculture in the EU economy

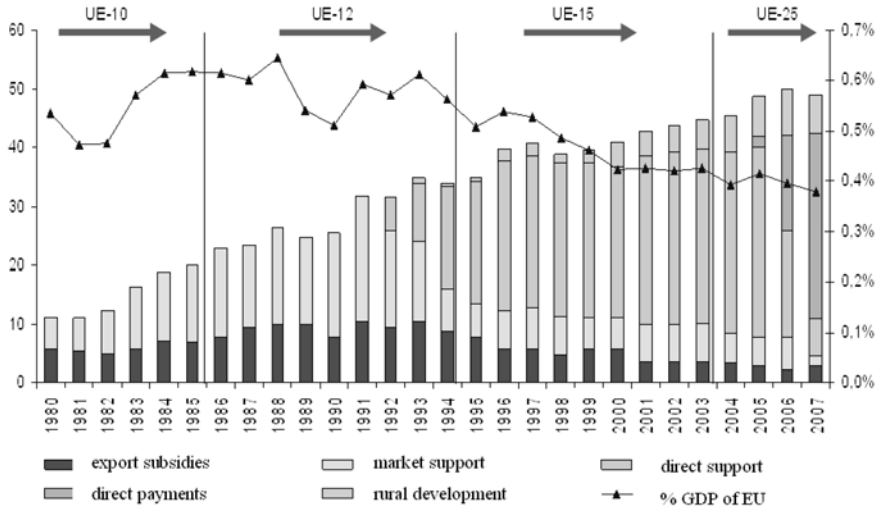
Agriculture and food industry are the important part of the EU economy. Their participation in GDP of the EU in 2008 was equal to ca. 4% and the value added, produced by the discussed sectors exceeded 190 billion EUR in the discussed year, with the employment amounting to ca. 18.6 million persons, i.e. almost 8.6% of all employees. Agri-food sector has a relatively greater meaning for the economy of the new member states, however according to the regularity, observed in highly developed countries, the decrease of the role of this sector in the national economy occurs together with the economic development. In parallel, the development of other sectors of the economy (mainly of services) is observed; in food-agricultural sector, the increase of productivity of capital is recorded. In consequence, it leads to decline of prices of agri-food products as compared to the prices of the remaining goods and services. Role of food economy in the national economy is, however, very much differentiated between the particular EU member states.

Production-economic structures of the EU agriculture reveal also a high diversity between the particular countries and even between their regions. The mentioned differences are the consequence of, *inter alia*: level of economic development, historical background, natural and climatic conditions and various institutional frames. The mentioned diversity is reflected in physical and economic size of the farm, production intensity or productivity. The employment coefficient in the EU-27 agriculture varies from ca. 1% in Great Britain to ca. 20% in Bulgaria and Rumania. As a result of the successive enlargements of the EU, the number of agricultural farms increased from 5.8 million in 1980 to 14.5 million in the EU-27 [1].

The CAP reforms, conducted in the years 2000-2007 were aimed at the improvement of its efficiency and effectiveness via the improvement of market oriented production, increase of its competitiveness, assurance of the positive effect of agriculture on environment, improvement of production quality, food safety and animal welfare and sustainable development of rural areas. The shift of the main accent of support, from prices to incomes, together with the enlargement of instruments of developing the rural policy allowed market mechanisms to play a greater role in allocation of resources. Introduction of the single payment scheme (decoupled payments) was intended to serve this aim. The effectiveness of the discussed instrument was also supported by OECD studies, which showed their smaller influence on production as compared to the earlier support of prices or direct aid.

The change of agricultural policy instruments, introduction of modulation mechanisms and financial discipline have considerably changed the level and structure of financial support of agricultural sector and rural areas. Owing to the discussed changes, most of the CAP budget was destined for payments, being not connected with production and direct payments, and only 20% of the CAP budget was destined for actions being directly connected with the market and support of export. The introduced reforms have also contributed to systematic increase of expenses on development of rural areas (at present, about 15% of the CAP budget). In consequence of the conducted reforms, and also of the earlier reform of MacSharry, the participation of expenses on agriculture in the EU budget and in GDP was systematically decreased (Figure 2). In 2007, the expenses of the CAP, although were almost five times higher than at the beginning of the eighties and amounted to ca. 50 billion EUR, they constituted only ca. 40% of GDP of the "EU-25" whereas in the eighties, the discussed participation exceeded 60%.

Figure1 - Expenses on CAP during the years 1980 – 2007, in billion EUR and as percent of GDP



Source: Own elaboration on the basis of Eurostat data

From the preliminary budget plans, revealed by the European Commission, it results that the means for rural development have been increased by 0.3 billion EUR to the level of 13.9 billion EUR as compared to 2009 and for the implementation of the aims of the CAP Pillar Two – from more than 2.9 billion EUR to 43.7 billion EUR. The total budget of the EU is concentrated on the acceleration of reconstruction of the European economy, suffering from the consequences of the world crisis.

Table 1 - Distribution of the expenses on the CAP according to the preliminary draft budget of the EU for 2010 (in million EUR)

Specification	2009.	2010.	Change in per cent
Pillar One	41.127	43.745	6,4
Market actions	3.410	4.042	18,5
Direct payments	37.779	39.326	4,1
- in decoupled form	31.296	33.374	6,6
- % complete direct payments	83	85	-
Pillar Two	13.652	13.975	2,4
CAP in total	**54.779**	**57.720**	**5,4**

Source: [4]

The participation of the funds, destined for the measures connected with agriculture (ca. 40% of the total sum of the budget expenses i.e. the amount of ca. 139.5 billion EUR) will be however, unchanged. The increase of the expenses on Pillar Two will be caused by 2% higher modulation. The obtained additional sum will be destined for payments connected with the "new challenges" and development of rural areas. The total expenses on the market and structural pillar of the CAP in 2010 will be found on the level of 57.3 billion EUR, i.e. by 2.9 billion EUR more than in 2009 (Table 1).

Higher expenses and costs of the CAP running are also connected with the mechanism of phasing-in which generates greater expenses on direct payments in the new member states. They reflect also certain prognosis increase of the market support, mainly in the dairy sector. As a result of

the mentioned changes, Pillar One of the CAP will cover more than 31% of all expenses of the European Union in 2010; further ca. 11% will be destined for rural development, environmental protection and the Common Fisheries Policy. In spite of the expected current increase of expenses on implementation of the CAP within the frames of the Pillar One and Pillar Two in 2010, general decline of the mentioned expenses down to the level of 33% of the EU budget until 2013 is anticipated. Systematic decrease of the expenses on agriculture and development of rural areas in GDP is connected with the economic development of the EU, increase of the role of other EU policies and also, with the effects of the CAP reform implementation.

3. Changes in Poland's food sector 5 years after the accession to EU

The attempt to make an in-depth analysis of macroeconomic social and economic effects of Poland's membership in the EU after nearly 5 years is a risky task. Due to the relatively short time, it is difficult to assure methodologically correct separation of permanent effects and the phenomena resulting from the economic cycles or random events. The macroeconomic and microeconomic results of Poland's adjustments to the legal and institutional solutions of the "old" EU were not fully materialised yet.

The course of economic processes in Poland was influenced by geopolitical threats, significant changes in raw material prices, especially crude oil price, as well as instability of financial markets. These phenomena would have affected Polish economy irrespective of our membership in the EU.

Mutual full opening of markets was not a hindrance to the development of the Polish food economy; instead it became a strong impulse for its growth. The following phenomena serve as evidence for such an assumption [1]:

- Within the 5 years of our membership in the EU the export of agri-food products increased from EUR 4.0 billion to EUR 11.3 billion (2.8 times), whereas the import increased from EUR 3.6 billion to EUR 9.8 billion (also 2.8 times), and the surplus increased 3.3 times from EUR 0.4 billion to EUR 1.5 billion.
- The trade with other EU states grew even faster. Food deliveries from Poland to the EU-25 States in 2003-2005 increased by 248%, whereas imports to Poland increased by 212%.
- The EU membership gave a new, very strong impulse to the export of Polish agri-food products to EU-10/12 countries. The increase in trade dynamics with these countries and the improvement of results were especially visible in recent years, whereas the trade with EU-15 noted a decrease in dynamics and the deterioration of results.
- The positive balance of foreign trade in agri-food products has improved: in total from EUR 0.4 billion in 2003 to EUR 1.5 billion in 2008, with EU-25 States from EUR 0.4 billion to EUR 2.3 billion in 2008, with EU-15 States from EUR 0.2 billion to EUR 0.8 billion in 2008 (but in 2006-2007 it was EUR 1.5 billion); with EU-12 States from EUR 0.2 billion to EUR 1.5 billion in 2008.

Foreign trade in this period became an important factor of the development of the situation in the food industry and in agriculture, because with a relatively stable domestic demand it absorbed vital part of the increase in domestic production. The share of the export in the production sold in 2008 reached 22%, as compared to 16.5% in 2004 and 10.5% in 2000 [9].

After Poland's accession to the EU, the global agricultural production in fixed prices amounted

to about PLN 58.5 billion and was on average 2.5% higher than in 2001-2003. In that period animal production increased by 6.9% and plant production decreased by 1.1%. The feature of plant production development is the faster growth rate of final production and commodity production than global production, which means that internal absorption decreases, both in respect to production and consumption, and the level of commodity production increases.

In 2003-2008 there have been important changes in the income situation of agricultural holdings in Poland. The income of Polish farmers grew significantly after Poland became an EU Member State in 2004. The income received from agricultural holdings in the pre-accession period increased over 2 times per 1 full-time employee (working at least 2,200 hours in an agricultural holding annually). The subsidies received by farmers from non-market sources had a fundamental impact on this favourable change of income situation. Although in 2003 the subsidies amounted to 9.4% share of income, the following year their share increased to 39%. The greatest share of subsidies in income in the discussed period was noted in 2006 when subsidies had greater importance than production activity in the creation of income. After the accession the relative profitability of farmers in relation to other occupational groups has also improved. The average agricultural income converted to 1 full-time employee amounted to 24.2% of the average net salary in the national economy in the pre-accession period, but in the first year of the accession this rate more than doubled and reached 56.2%. In the following years these relationships ranged from 43.3% in 2005 to 57.5% in 2007, a very good year for agriculture.

According to estimates conducted in line with the method of Economic Calculations for Agriculture, the production value of the Polish agricultural sector measured with the market prices in 2004-2008 increased by over 18.7% and for subsidies by 38.5%. At the same time the worth of indirect absorption increased by 28.1%. As a result the income per full-time employee in agriculture decreased in that period by 2.2%, whereas the average net salary in national economy increased by 27.3%. Now we must recall the assumptions and results of the forecast of farmers' income drawn up by the European Commission for 2005-2014. They indicate that the real income calculated per full-time employee will increase by 32.2% in 10 countries which entered the European Union in 2004 on condition that the employment (measured with the number of full-time employees) in agriculture is at the same time lowered by 21.8%. In order for this increase in income to take place, the employment in agriculture must decrease in the same period by 2.4% on average per year.

Table 2 - Selected data on income and subsidies in the sector of agricultural holdings in Poland in 2003-2008

Specification	Unit	Year					
		2003	2004	2005	2006	2007	2008
Average net salary in national economy	**PLN**	17,622	18,325	19,060	19,840	21,570	23,330
Income per one full-time employee	**PLN**	4,259	10,290	8,252	9,984	12,411	10,062
Index of income for average salary	**%**	24.2	56.2	43.3	50.3	57.5	43.1
Subsidies per one full-time employee	**PLN**	402	4,009	3,882	5,198	5,352	5,019
Share of subsidies in income	**%**	9.4	39.0	47.0	52.1	43.1	49.9

Source: Calculations of Z. Floriańczyk and L. Goraj (IAFE-NRI) on the basis of macroeconomic calculations for agriculture – EAA and the CSO data.

After the accession to the EU, the financial indicators of the entire food industry improved drastically. Between 2004 and 2007, as compared to 2003 [1, 2]:

- net profitability doubled to about 4% of the value, and ROE increased 2.5 times to about 12-13%, i.e. to the level over double as high as the basic percentage rate of the National Bank of Poland,
- profitability rates increased to a smaller degree: gross profit (from 2.5%-3.0% to 4.5-5%), cash revenues (from about 5% to 7%) and operational surplus (from 8.5% to 9.5%),
- cost-burdens of financial revenue decreased (from 2.3% to 1.2-1.3%) along with profit income tax-burdens (from 40% to about 20%); these are main sources of the improvement of net profitability rates,

4. New challenges faced by the CAP and the development of agriculture and rural areas in Poland

Rural development represents an important priority of the common CAP which should be implemented through the second pillar of this policy. In actual fact, instruments and programmes of the second pillar of the CAP are aimed to support farmers rather than the rural population. Efforts to create a common rural development policy have been made for years. The failure to achieve this goal should be attributed to procedural complexity, high transaction costs of the instruments offered under the second pillar of the CAP, difficulties with the identification of institutions and persons responsible for rural development, the great diversity of rural areas in Europe, thus different priorities, which in turn complicates the definition of "common" elements in the rural development policy [11].

It should be noted, however, that the share of the rural population has been slightly increasing. Particularly strong population growth has been in rural areas in the proximity of major cities or in those characterised by attractive rural and natural landscape. At the same time, fluctuations in the number of rural residents are increasingly accompanied by a marked downward trend of the farming population, following the fall in the number of family farms. As their number decreases, the role of agricultural holdings in providing the source of income is gradually diminishing [8]. Therefore, economic activity and sources of income of the farming population have been increasingly diversified. In 2005, farming provided the main activity and income source only for 36% of households with a farm of more than 1 ha of agricultural land, whereas the corresponding figure for 2000 was 42%. Such rural households accounted for 36% and 43% respectively of the farming population [6]. The analysis of the non-farming population has primarily demonstrated that this group represents a growing and ever more significant share of the rural population. Therefore, the rural community can no longer be identified exclusively with agricultural activities. As many as 57% of rural families own no agricultural land and 46% of private farms does not exceed 5 ha of cultivated land and for most of them main source of income is other than agricultural production [7]. In some regions of Poland, particularly in the north and southwest, the group in question accounts for three-fourths of the total number of families. Even in the eastern Poland, where agricultural holdings have been characterised by very traditional family ties, non-farming families represent nearly half of the rural community, irrespective of the economic status of individuals.

The analysis of the socio-economic structure of rural population suggests that the upward trend of the number of non-farming population will continue and that this socio-occupational group will increasingly determine the socio-economic development of rural areas [7]. One should bear in mind that in the present picture of the Polish countryside agriculture plays a diminishing role,

whereas non-agricultural elements have been gaining in importance, in terms of both employment and income of the rural population. The countryside has been losing its rural character and evolving towards multifunctional agriculture and rural areas development, which appears to be a universal development path [10]. Also dynamic changes in the European and global agricultural and food market confirm the great meaning of traditional functions, played by the agriculture and rural areas. It refers, *inter alia*, to such aims as: securing food supplies at moderate prices for the consumers, ensuring high competitiveness of production, maintaining stability of agricultural markets, or support of agricultural incomes. Increase of the prices of agricultural products and food in many regions of the world should be treated as a signal indicating the possibility of further perturbations on the international agricultural markets. At the same time, other risks of global character are recorded which force the change in attitude to agriculture and agricultural policy. The new threats and challenges indicate the need of considering the new areas connected with the agricultural activity in the aims and instruments of the CAP.

One of the most important challenges which the CAP will encounter in the future includes strengthening of positive effect of agricultural activity on natural environment. Depending on the type of production, its intensity, the employed technology and production concentration, agriculture may exert a positive or negative influence on natural environment. The EU and national legislation regulates the problems of limitation of the consequences of agricultural activity for natural environment in a greater and greater scale. It may be exemplified, *inter alia*, by high requirements in respect of environmental protection, animal welfare and food safety, being imposed on the farmers within the frames of the principle of mutual conformity (cross-compliance). Further intensification of environmental requirements will be connected with the expensive adaptive investments. It will be necessary, in the future, to find out a compromise between the production aims and the environmental goals. The increase of manufacturing costs, resulting from limitations and adaptations makes the European farmers to be in worse competitive position in relation to the producers from the countries which do not employ such requirements.

Other challenge for future CAP is ssupport of the incomes of the farms which implement the new aims and tasks of the policy. The characteristic feature of the European agriculture includes a dominating participation of agricultural family farms. The mentioned situation has not been principally changed in spite of the ongoing restructuring. In case of further world trade liberalization and increase of external competition, the participation of non-commercial farms in the total number of the farms may even be somewhat increased. In the future, a big part of agricultural family farms will also have difficulties in reaching the economic scale which ensures the extended reproduction. At the same time, the discussed farms will still play a significant role in the implementation of new public functions (such as e.g. preservation of traditional rural landscape, care of biodiversity etc.). It should be, therefore, assumed that support of agricultural incomes via the CAP will determine the economic vitality of a great part of the European agriculture; the future system of direct support of incomes should not, however, disturb functioning of Single European Market and inhibit natural restructuring and concentration processes.

Strengthening of rural development and ensuring territorial cohesion in the EU. In many EU regions, agriculture remains still the main host of rural areas. Owing to the instruments connected with the production and agricultural resources (Pillar One) and the instruments of Pillar Two, The Common Agricultural Policy strengthens social functions of rural areas. The mentioned areas constitute the important element of geographical and social-economic biodiversity but paradoxically, the differences in the level of economic development are just the greatest ones in the discussed areas. Differentiation of economic activity, ensuring an access to social services, and transport and telecommunication network has a significant meaning for striving at assurance

of territorial cohesion and preservation of rural vitality.

In the light of the submitted arguments and Polish experiences resulting from the five-year membership in the EU and its effects on Polish agriculture and rural areas, it seems to be purposeful and justified to preserve, also in the future, its three elements, i.e. Common Market Organization, scheme of direct payments and policy of rural development. It does not mean that the CAP after 2013 should not meet the new European and global challenges.

The reached agreement "Health Check" contains significant, from Polish viewpoint, solutions concerning the future shape of the CAP after 2013. The priorities concerning further CAP reforms have been defined in document: "Polish vision of the Common Agricultural Policy after 2013 – assumptions and preliminary suggestions" [5]. When respecting the Community goals of the CAP and the principle of subsidiary, we think that the future CAP should consider conditions and problems which seem to be specific from Polish viewpoint, i.e.:

- Positive effect of the present CAP on development of agri-food sector and of rural areas and on leveling of the developmental distance between the agriculture of Poland and the EU-15 states and between the rural and urban areas;
- Striving at ensuring the equal conditions of competition for agricultural sector in Poland in relation to other member states;
- Evolutionary character of the path of the CAP changes, with the aim to adapt it to the new tasks and conditions in a global, not only in the European scale.

Preservation of the possibilities of the market support is significant not only from Polish viewpoint, especially in the sectors, affecting strongly the environment and having a great economic meaning for the economy of the regions. Instruments of market intervention are important for most of the middle-size farms, having smaller possibilities of managing with crisis situations. On the other hand, commercial farms require support in the field of utilization of modern instruments of risk management. Direct payments should become one of the main CAP instruments, being responsible for support and stabilization of agricultural incomes, compensating the costs connected with meeting the high standards of quality and methods of production and environmental requirements and also, maintaining agricultural production in less favored areas. Policy of rural development should play a leading role in process of stimulating the structural transformations, in counteracting the climate changes, rationalization of water resources management, and protection of biodiversity and utilization of renewable energy sources. Apart from it, cohesion policy should receive greater meaning in stimulation of changes in rural areas. The priority of Poland should include the elimination of differences in the level of economic development of rural areas between the particular regions and also, reduction of such distance between rural and urban areas. Only comprehensive support of rural areas will enable their lasting and sustainable development, contributing simultaneously to the increase of the competitiveness of agricultural sector.

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Parallel Workshop Session B

ROLE OF HUMAN AND SOCIAL CAPITAL IN BUILDING UP AGRO-REGIONAL IDENTITY, INSTITUTIONAL REFORM AND COMPETITIVENESS

THE IMPACT OF SOCIAL CAPITAL ON THE REGIONAL GROWTH AND COMPETITIVENESS IN POLAND

Urszula Bronisz[1], Wim Heijman[2]

Abstract

This article aims at presenting different approaches to the phenomenon of social capital. The concept of social capital is ambiguous and that is why we will highlight a number of definitions of this notion. The central attention of the paper focuses on the relationship between social capital and regional development and competitiveness. The fundamental question concerns the impact of social capital on the regional economic performance. Hence, we will survey the empirical examination of 16 Polish regions in terms of social capital. We will also study whether the regional level of social capital depends on the level of competitiveness. The purpose of this article is also to make a contribution to the discussion concerning the relationship between economic development and social capital.

Key words: Social capital, regional growth, Polish regions

Introduction

Social capital has attracted a lot of attention from scholars and practitioners. It has generated a lot of interest within statistic and policy research. The phenomenon of social capital is one of the most popular concept covering economic and sociologic dimensions, widely used in multidisciplinary research. It is considered as important factor in explaining economic success and development. There are many different approaches and definitions attached to the concept of social capital. However, there is some consensus within social and economic sciences towards a definition that emphasizes the role of networks and civic norms. Social capital is generally understood as the property of the group rather than the property of the individual. The key indicators of social capital include social relations, formal and informal social networks, group membership, trust and civic engagement.

Poland is a part of the former "Eastern Block" and that is why its social capital development differs from the western countries. In 1989 Poland embarked on the process of systemic transformation, and in the initial years the state's economic policy was dominated by macroeconomic priorities designed to establish a new order after the centralized command system. Hence, regional policy was not perceived as an instrument for balancing out spatial differentiation. Nor was regional development seen as a factor is supporting the development of the country as a whole, a factor contributing the identification and use of peculiar features, resources, circumstances and developmental predisposition of individual regions as a specific "value added". Since 1989, Poland has succeeded in the transition to a modern market economy, implementing key market reforms including liberalization, deregulation, privatization and other institutional changes. These reforms brought about a remarkable upswing in economic

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performance and Poland's international competitive position (Weresa 2006). However, the international dimension of competitiveness requires an assessment of the region's ability to compete and attract different types of capital indispensable for growth and development. The social capital has undergone changes during the Polish systemic transformation, however, lack of social capital and the need of building it, and has been recommended among other by F. Fukuyama for all post communist countries.

This article aims at evaluating the level of social capital in 16 Polish regions, which correspond to the EU NUTS II level. It is becoming clear that regions are now the key source of economic vitality for nation-states. Yet, the analysis of social capital and its relationships with regional income and competitiveness in Poland will be difficult. There a number of research constraints. First of all, the territorial reform in the year 1998 completely changed spatial structure of the country. System of the 49 voivodships was substituted for 16 large regions. Furthermore, Poland's membership in European Union in 2004 meant necessity of adjusting to European Nomenclature of Units for Territorial Statistics (NUTS). However, the growing knowledge about the role and importance of social capital and its impact on economic development makes it essential to analyze.

The paper is structured into principal sections, followed by a set of conclusions:

- a review of the concept of social capital including the plethora of definitions that surround this notion (Coleman (1988,1990), Putnam (1993, 1995, 2000), Fukuyama (1995, 2000), Portes (1998), Halpern (1999, 2001), Woolcock (2001) and its impact on the regional development and competitiveness,
- a research framework concerning measuring social capital in Polish regions,
- final results.

Theoretical foundation

There are a lot of studies concerning the social capital. This notion is defined and explained in many various ways, depending on the context and application of the concept. Social capital emerges in numerous different manners so it is difficult to precisely conceptualize this phenomenon. In terms of theoretical foundation, there is a lot of ambiguity as to what the concept of social capital means. A number of academics and researchers emphasize the increasing role of social capital in relation to many different human areas including economic development, however, it was the work of Robert Putnam (1993, 2000) that launched social capital as a popular forms for research and policy discussion. Social capital is commonly thought as a fourth form of capital, along with financial, human and physical. Like these other forms, it is important determinant of prosperity and its purpose is to make productive activity possible (Coleman 1998). Although, the definition of social capital has remained elusive and ambiguous this notion is also considered as important factor in explaining economic success. Hanifan defined it as: "*those tangible substances that count for most in the daily lives of people: namely good will, fellowship, sympathy, and social intercourse among the individuals and families who make up a social unit (*Hanifan 1916). Social capital is the opposite of physical capital, which comprises land, buildings and all other forms of private or public owned capital. According to Beekman (2008) social capital "*can be recognized by social interactions and their by-products: trust relations, reciprocity and exchanges, common rules and norms, and networks and groups."*

The Organization for Economic Cooperation and Development (OECD) defines social capital

as "*networks together with shared norms, values and understandings that facilitate cooperation within or among groups"* (Cote and Healy 2001), whereas The World Bank (1999) provides more extensive explanation of this term and suggests that "*social capital refers to the institutions, relationships and norms that shape the quality and quantity of society's social interactions"* and emphasizes that "*social capital is not just the sum of the institutions which underpin a society – is the glue that holds them together."* The definition created by The World Bank is similar to the most commonly used definition originates from Putnam (1995). He defines social capital as the "*features of social life – networks, norms, and trust – that enable participants to act together more effectively to pursue shared objectives. Social capital, in short refers to social connections and the attendant norms and trust".* He also argues (Putnam 2000) that social capital "*has forceful, even quantifiable effects on many different aspects of our lives,"* which include such diverse dimensions like better health (Wilkinson 1996), lower crime rates (Putnam 2000), improvement in education (Coleman 1998), greater levels of income quality (Wilkinson 1996), less corrupt and more effective government (Putnam 1995), better economic achievement and lower transaction costs (Fukuyama 1995). Coleman (1990) points that "*social capital is defined by it function, it is not a single entity, but a variety of different entities having characteristics in common: they all consist of some aspect of a social structure, and they facilitate certain actions of individuals who are within the structure."* Social capital generate a lot of advantages. Wollcock (2001) notices that "*one of the primary benefits of the idea of social capital is that it is allowing scholars, policy makers and practitioners from different disciplines to enjoy an unprecedented level of cooperation and dialogue."*

Much of the general literature concerning social capital is focused on using it to build human capital, in the sense of developing strong communities. However, in recent years, a research has grown up around social capital building for community development (Servan 1997) and for economic development (Grisham 1999, Flora 1998, Talbert, Lyson and Irwin 1998, and Flora, Sharp and Flora 1997). Relationships between individuals, norms and trust all help facilitate coordination and cooperation that enhance productivity (Routledge, and von Amsberg 2002). Flora (et al. 1997) call the social capital necessary for successful economic development in entrepreneurial social infrastructure. They assert that cooperation, not competition is more likely to foster economic activity. Putnam, Leonardi and Nanetti (1993) emphasize that traditions of civic engagement, voter turnout, active community group and other such manifestations of social capital are necessary for both good government and economic and financial development, however, the connection between economic prosperity and social capital is not always clear. Definitely, social capital is a multidimensional and dynamic concept and that is why it can be described in numerous ways. Dasgupta (2002) argues that *social capital should not be defined only in terms of the presence of cooperation or some other outcome. Rather than it should be regarded directly as social structure, because social capital is an aspect of human capital, it is also a component of what economists call "total factor productivity"*. Ostrom (2000) points out that *social capital is the shared knowledge, understanding, norms, rules and expectations about patterns of integration that groups of individuals bring to a recurrent activity.* Undoubtedly, one of the greatest weaknesses of the term of social capital is the absence of common agreement of how to measure it. This notion is usually depicted by such categories as trust, associational activity, groups, networks and knowledge. As a social capital measures are also indicated educational achievements and family structures (Robinson and Siles 1998). Furthermore, as a key factor in building social capital are considered non-governmental organizations. Social capital is always desirable since its presence is equated with beneficial consequences. It measures the degree to which community can cooperate to achieve desired results (Buckland 1998). The area where governments have the greatest directly ability to generate social capital is education. However, educational institutions do not simply transmit human capital, they also pass on social

capital in the form of social rules and norms (Fukuyama 1999).

Methodological foundation

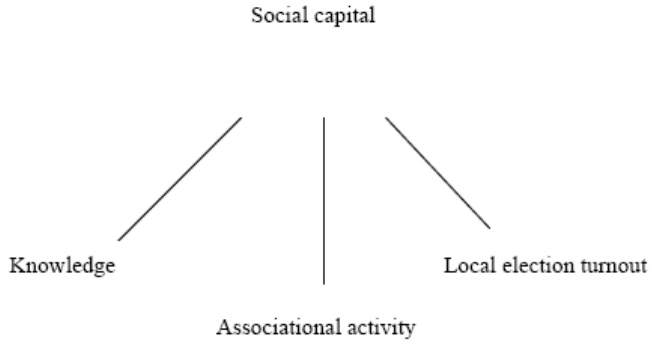
The main purpose of this paper is to rank Polish regions according to their performance of social capital and further to compare the received outcomes with their competitive position. The current paper will also examine the impact of distinguished factors of social capital on regional development. Thus, we will see whether the social capital has influence on the regional economic success. In order to present the performance of social capital in Polish regions we will create an index of social capital. We will take into account variables from 3 different categories which are often applied in empirical examinations to estimate the level of social capital. The 3 categories are: knowledge, associational activity and the local election turnout. The comparative analyses will cover the evaluation of following factors:

- knowledge: the number of upper secondary students, vocational education students, tertiary students (academic), tertiary students (occupations),
- associational activity: the number of nongovernmental organization, volunteers, cultural activity, sports and recreation activity, social welfare services,
- local election turnout.

We consider these factors as crucial determinants of social capital. They reflect community engagement, community spirit and territorial membership. We are aware about the limitation and imperfection concerning the issue of social capital in the context of measuring the regional level of social capital. Therefore, in our survey we will focus almost exclusively on statistical analyses of social capital. The index of social capital will be created as the sum of the standardized values of: upper secondary students, vocational education students, tertiary students (academic), tertiary students (occupations), nongovernmental organization, volunteers, cultural activity, sports and recreation activity, social welfare services, local election turnout. Data of essential measures will be gathered from Polish Central Statistical Office sources.

Our intent of this survey is to evaluate the Polish regional level of social capital. The carried out examination allow us to construct the index of regional social capital and than to compare the position of 16 Polish regions with their locations in the index of regional competitiveness from our previous research (Bronisz, Heijman, Miszczuk 2008). In the competitiveness research in order to provide an overall picture of regional level of competitiveness we followed the Robert Huggins Institute approach (Huggins, 2003). We took into account the impact of three categories: inputs, outputs and outcomes. The key input factors were: business density, knowledge based business and economic participation, although, there were many indicators underneath these subsets. Next, these variables were conceptualized as contributing to the output – productivity, measured GDP per capita. And finally, as the impact of these measures - the outcomes – the earnings and unemployment were given. The 16 Polish regions were ranked according to their scores on each indices. Then was assessed the importance of business density, knowledge based business, economic participation, productivity, earnings and unemployment on the basis of the scenarios created by Huggins Institute. And finally it was possible to achieve the robust results of competitiveness of Polish 16 voivodships.

Next, using a test of significance of correlation coefficient we will be able to observe the relationship between regional development and distinguished factors – determinants of social capital. Than we will also examine the correlation between index of social capital and both, index of regional competitiveness and GDP per capita. Thus, we will find out whether social capital can be regarded as the crucial determinant of regional development and competitiveness.



Results

Poland represents a country with significant regional disparities, however the most competitive Polish regions have not only good economic performance but they are also characterized by high level of social capital. The highest score in the social capital index achieved Śląskie voivodship. In the top head of ranking we could find also Mazowieckie and Małopolskie. These are the regions that have the ability to attract creative and innovative people, to provide high quality cultural facilities and to encourage the development of social networks. These regions are also considered as the most competitive, they are marked by the highest density of enterprises, and the highest level of economic participation. What is more, Śląskie, Mazowieckie and Małopolskie took the best locations in both rankings, concerning the regional level of social capital and regional competitiveness. The most economically disadvantaged regions like Opolskie and Świętokrzyskie are at the same time characterized by poor social capital performance. But social capital does not always create a regional development. Zachodniopomorskie voivodship took fifth position in the index of social capital but only twelfth in the ranking concerning the overall regional competitiveness. Thus, the surveyed examination can also suggest that regional prosperity may be created in many ways. In order to find out whether determinants of social capital have influence on regional development we examined the impact of 10 variables on GDP per capita. Five of them had significant correlation, namely: the number of upper secondary students (coefficient correlation r=0.816), vocational educational students (coefficient correlation r=0.708), tertiary students (academic) (coefficient correlation r=0.916), social welfare centers (coefficient correlation r=0.570) and number of nongovernmental organizations (coefficient correlation r=0.728). The statistical irrelevant were following factors: tertiary students (occupation), physical culture and sport, volunteers, family orphanages, and local election turnout. The most significant relationship had the factor – the number of tertiary students (academic). It can means that regions with relatively high level of well educated people develop more dynamic and achieve better economic performance. However, the most important factor was tertiary education (academic), whereas the factor tertiary students (occupation) did not have any significant impact on economic development. Some previous studies also revealed significant correlation between educational level and economic development (Bishop 1989, Hanusbeh and Kim 1995, Barro 1998). Those results suggest that this factor should be considered as important feature of social capital. Certainly, one of the key factors of social capital is also non-governmental organization. They have a comparative advantage in community development, they also offer opportunities and access to social development (Buckland 1998). There are some specific features of the Polish non-

governmental system (Frysztacki 1996), namely:

-very rapidly growing number of no-governmental institutions,

-strong structure of groups linked with church,

-small size,

-small share of full-time employees,

-high share of public funding of this sector activities.

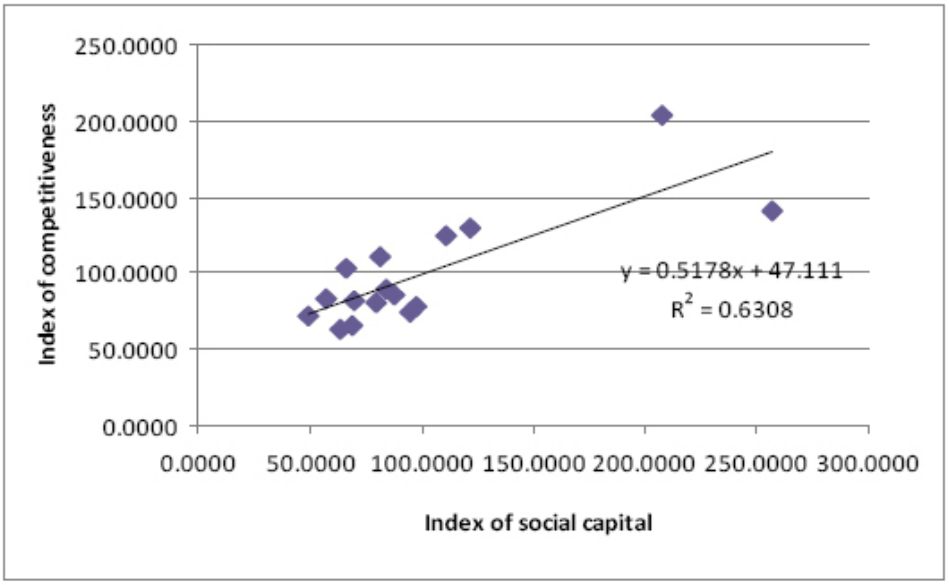
Using a test of significance of correlation coefficient we also examined the relationship between index of social capital and index of competitiveness and between index of social capital and GDP per capita. Both had significant correlation, however the index of competitiveness had a little better outcome. The problem is the mutual influence of index of social capital and index of competitiveness or GDP per capita. The correlation does not show the direction of the relationship. It is very difficult to distinguish statistically the impact of social capital on competitiveness or GDP per capita from the relation proceeded in reverse direction (Herbst 2007). Therefore, it is at least theoretically possible that the regional prosperity and competitiveness create the regional social capital. But undoubtedly, social capital facilitates mutually beneficial collective actions. Both, social capital and economic development are multidimensional concepts and this makes possible to emphasize and focus on particular aspects of these concepts. But undoubtedly, the results of our research lead to the conclusion that social capital can be regarded as the crucial determinant of regional development and competitiveness.

Table 1 - The social capital index and competitive index of 16 Polish regions (voivodships)

Region	Index of social capital	rank	Index of competitiveness	rank	GDP per capita	rank
pl11 Lódzkie	84.3122	8	88.6415	7	99.8993	7
pl12 Mazowieckie	207.4805	2	203.5300	1	164.2591	1
pl21 Malopolskie	121.9266	3	128.9457	3	92.6930	11
pl22 Slaskie	256.5813	1	140.2345	2	121.8801	2
pl31 Lubelskie	69.7999	11	81.1463	10	75.2354	16
pl32 Podkarpackie	95.1373	6	74.3508	13	75.7185	15
pl33 Swietokrzyskie	63.6111	14	62.7492	16	83.9329	13
pl34 Podlaskie	57.4167	15	83.2733	9	80.9953	14
pl41 Wielkopolskie	81.8520	9	110.2475	5	116.5884	3
pl42 Zachodniopomorskie	98.0425	5	78.0590	12	100.8944	6
pl43 Lubuskie	87.9542	7	85.9641	8	97.0740	8
pl51 Dolnoslaskie	111.3091	4	124.4999	4	110.4707	4
pl52 Opolskie	49.6967	16	71.9127	14	93.2258	10
pl61 Kujawsko-Pomorskie	79.9652	10	80.4059	11	96.9875	9
pl62 Warminsko-Mazurskie	68.7524	12	64.7615	15	84.1883	12
pl63 Pomorskie	66.1626	13	103.5250	6	105.9574	5

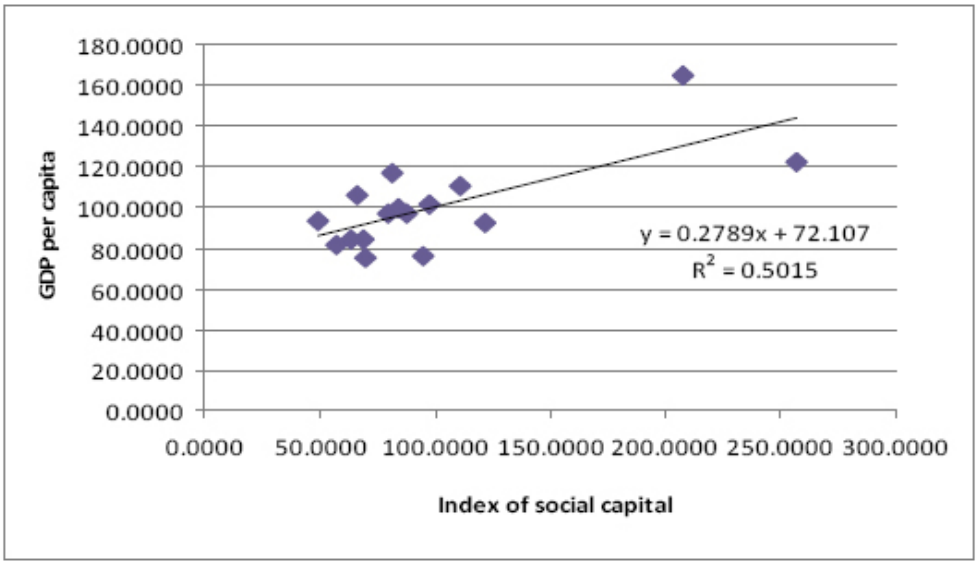
Source: Bronisz, U., Heijman W., Miszczuk A (2008) and own calculations.

Figure 2 - The correlation between Index of social capital and Index of competitiveness



Source: Own calculations

Figure 3 - The correlation between Index of social capital and GDP per capita



Source: Own calculations.

Conclusion

In this article we have tried to provide an overview of the phenomenon of social capital by describing theoretical and conceptual foundations and by surveying the empirical study concerning the regional level of social capital in Poland. We have examined 16 Polish regions and carried out the analysis in order to test the hypothesis – is regional economic development related to the social capital? Further, we have tried to measure the level of social capital in Polish voivodships and than rank them according to their achievements and final results. We also surveyed the correlation between index of social capital and both index of competitiveness and GDP per capita.

The received ranking of the social capital enabled us the examination of the regional performance of social capital in Poland. We were also able to compare the performance each of the 16 Polish regions in both rankings, concerning the regional level of social capital and relating to their overall competitiveness.

Although, along with the economic transformation regional and social disparities in Poland became increasingly evident, the ability of individual regions to adopt to fundamental changes in economic environmental rests on a range issues including their socio-economic structure, level of initial development and proximity to capital and innovation, as well as the way in which they are affected by national policy decisions (Gorzelak 2000). However, disparities in regional economic growth are a function of regional variations in different types of capital, there is evidence that there is a link between social capital and economic development. The existence of social capital might be helpful to explain economic progress of certain regions, because the use of regions' endogenous resources is the key factor of development in socio – economic sphere. Sometimes social capital can be insufficient for establishing endogenous sustainable development and economic prosperity, but at least it enhances economic capital and development.

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PARTIAL PRODUCTIVITY OF AGRICULTURE IN THE WESTERN BALKAN COUNTRIES – IMPLICATION FOR COMPETITIVENESS OF THE RURAL ECONOMY[1]

Stanislav Zekić, Milivoj Gajić, Koviljko Lovre[2]

Abstract

The process of transition and, within it, the agricultural transformation in the Western Balkan countries resulted, in the first phase, in the weakening of the developmental performances in agriculture. Such tendencies widened the gap between the countries of the Western Balkans and the EU countries, which continued their steady increase in agricultural productivity. Unfavorable tendencies in agricultural productivity adversely affected its competitiveness, and, consequently, the competitiveness of the rural economy as a whole. The effect of the low agricultural competitiveness on the competitiveness of the rural economy is determined by the importance of agriculture in the rural economy, which is substantial in the West Balkan countries.

Key words: Productivity, Agriculture, Competitiveness, Rural Development, the West Balkans, Transition.

Introductory Notes

The Western Balkan countries – Albania, Bosnia and Herzegovina, Montenegro, Croatia, Macedonia and Serbia represent the "un acceded" area of the South East Europe, and have, to a greater or lesser extent, come closer to the EU accession. During the process of accession, agriculture will certainly be one of the key issues in negotiations, due to the role the agrarian sector plays in these countries, and more importantly, its low competitiveness. In other words, agriculture in the Western Balkan countries is characterized by the predominance of small, individual farms which increasingly use semi-natural production methods. Such structure of the agrarian sector causes the unsuitable ratio of the number of active farmers to the area of land (expressed in *ha*) which consequently leads to a low level of agricultural partial productivity - especially labor productivity. The low level of agricultural competitiveness influences the competitiveness of the whole rural sector, where agriculture represents the dominant economic activity.

The Processes of Transformation and the Structure of Agriculture and Rural Areas

On one hand, the Western Balkan countries were characterized by large public/state firms; while on the other hand, there were small individual farms, which occupied most of the land area, with the exception of Albania. Therefore, Albania suffered the most dramatic consequences of the restructuring of farms, because all collectivized land was distributed to farmers and farm

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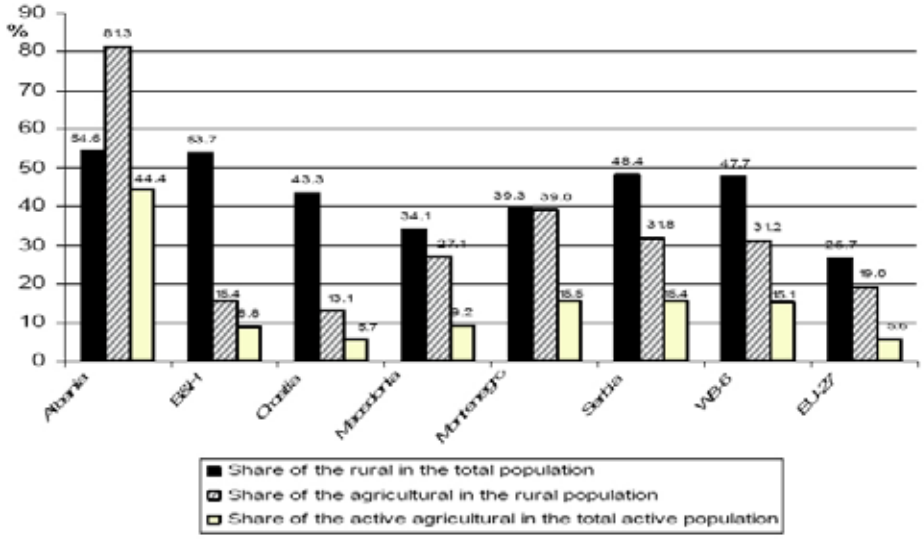
workers. The land privatization created around half a million new private farms, segmented into 1.900.000 parcels, where each farm consisted of between one and ten parcels, i.e. 3.3 parcels on average. During the 1990s, the average farm size in Albania was very small: 1.05 *ha*, and it stretched to 1.29 *ha* in the flat area[3] or shrank to 0.55 *ha* in the mountainous area (*Cunga, A., Swinnen, J. F. M., 1997, 7-8*).

The former Yugoslavia did not have collective farming during the socialist regime. The private sector was dominant in Bosnia and Herzegovina, Croatia, Macedonia, Serbia and Montenegro, and at the end of the 1980s it occupied around 82% of the arable soil (*Swinnen, J. F. M., Mathijs, E., 1997, 352*). As a result, the private land ownership has been dominant in all "heir states", i.e. there have been individual farms with a small average size, and with highly fragmented ownership structure, which has been caused by the retention of traditional inheritance laws. The very small average size of farms and high degree of land fragmentation represent a serious problem concerning the improvement of productive efficiency of individual farms. In Bosnia and Herzegovina, approximately 95% of the land, with an average size of 3 *ha* to 5 *ha*, is in private ownership. In Croatia, private ownership takes up 66% of the land, and the average size is 2.9 *ha*. In Macedonia, the private sector takes up between 70% and 85% of arable soil, consisting of farms with a very small average size of 2.5 *ha* to 2.8 *ha*. Serbia and Montenegro, like other countries, is characterized by predominance of private ownership, which occupies over 85% of arable soil. The rest of arable soil is in the hands of the state, and it is cultivated by huge state farms. These countries are undergoing the process of land privatization, so the share of private ownership is constantly on the rise. The average size of highly fragmented individual farms is very small, and it varies between 3 *ha* and 5 *ha* (*Csaki, C., Zuschlang, A., 2004, 68-115*). These farms mostly rely on their own workforce, which often consists of households with older members. Out of 800 000 farms, slightly over 100 000 have only one member. There are two members in slightly over 200 000 farms (*Bogdanov, N., 2004, 107*). Considering only registered farms, the average size of an individual farm is 6.3 *ha*, while the average size of agricultural firms is 431 *ha*.

Figure 1 - Rural, agricultural and active agricultural population



Source: Own calculations on the basis of FAOSTAT.

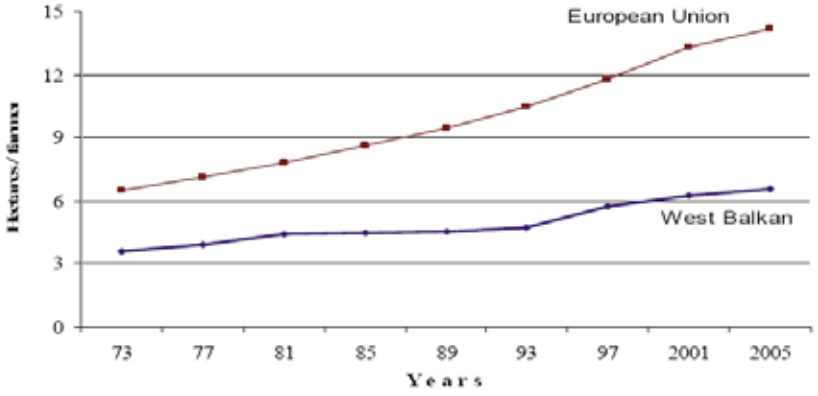
3 In some flat regions with limited land resources, the average farm size was less than 1 *ha*.

There is a relatively great number of inhabitants in the rural sector in the Western Balkan countries – almost 50%, and they are largely associated with agriculture – farm inhabitants make up around 1/3 of rural population – in Albania even 81% of rural population. In the EU-27, ¼ of population inhabits the rural area, and every fifth person works in agriculture as a primary activity. In addition, the share of active farmers in total active population is larger in the Western Balkan countries – around 15%, while, it is below 6% in the EU-27, and even less in the EU-15 (*Figure 1*). The share of agriculture in the total GDP varies from 7% in Croatia to 23% in Albania, while the percentage is one-digit in EU, with the exception of a few new member states.[4] According to all the criteria mentioned above, Albania represents "the most rural" and "the most agricultural" country in the region, which it largely owes to the farm structure. Agricultural structure highly affects the resource structure in other countries in the Western Balkans as well, which is reflected in the level of agricultural productivity and the competitiveness of the agrarian, and consequently the whole rural sector.

The Resource Structure in Agriculture

The favorable resource structure in agriculture, i.e. the ratio of basic productive factors of land and labor results in the predominance of mechanic or bio-chemical technology, which further influences the differences concerning the level and growth of partial productivity, as well as the differences in determination of labor productivity growth. Partial labor and land productivity are "connected" through the factorial relation between the land and the labor, which can be expressed as $(P/L) = (P/A) * (A/L)$, where P, L and A stand for production, labor and land respectively.[5]

Figure 2 - Structure of agricultural resources



Source: Own calculations on the basis of FAOSTAT.

Resource structure in the countries of the Western Balkans is far more unfavorable than in the EU-27 (*Figure 2*). Resource favorability varies significantly in the Western Balkan countries. The greatest availability of arable land per labor has Croatia, and the smallest Albania, the

4 Source: earthtrends.wri.org.

5 The volume of agricultural production is expressed in 1990 international dollars; the labor is represented through the number of active farmers, and the land through the sum of arable land, multi-year crops, meadows and pastures. All categories are defined according to the FAO methodology, since the data is taken from the FAO database FAOSTAT (*faostat.fao.org*).

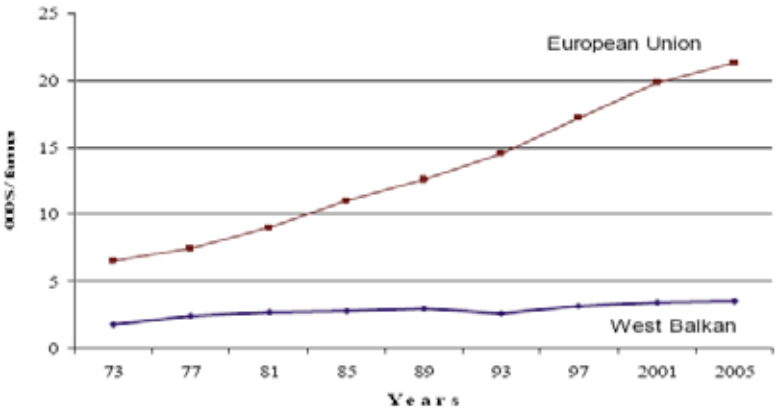
only country in the region which has witnessed decease in the land/labor ratio. Within this context, Serbia could be among the countries with less favorable resource structure, i.e. with a relatively high number workers in agriculture (*Zekić, S., 2008, 67*).

On the plus side, however, the transitional process within all the countries of the Western Balkans, considering all the changes in the agrarian structure, has largely improved the change of more or less extensive ownership structure that is represented here with the rising amount of arable land per farmer. However, this ratio is still lower compared to the EU countries. Although the intensity of changes in the agrarian structure is, on one hand, a function of general economic development, it is necessary to point out that, on the other hand, it is determined by the agrarian policy as well, especially by the policy of structural reconstruction of agriculture in the countries in transition, i.e. their readiness to base their agrarian reforms on the European agrarian model, whose last evolutional feature is associated with agricultural multifunction within the integrating policy of the agrarian and rural development (*Gajić, M., Lovre, K., Zekić, S., 2007, 592-593*).

Partial Productivity in Agriculture

The analysis of labor productivity in agriculture, measured by the volume of agricultural production per active farmer, shows that it significantly falls behind in the countries of the Western Balkans compared to the EU countries. Although there has been a slight increase in this type of partial productivity over the past fifteen years in the Western Balkan countries, the gap with the EU-27 has additionally widened. In other words, the gap concerning labor productivity between these two groups of countries rose from 1:2.53 between 1973 and 1989 to 1:3.43 in the period between 1990 and 2003. The gap is even wider if the comparison includes the "old" EU member states, i.e. EU-15 and it is 1:3.88 and 1:4.92 in pre-transition and transition periods[6] respectively (*Figure 3*).

Figure 3 - Level of labor productivity



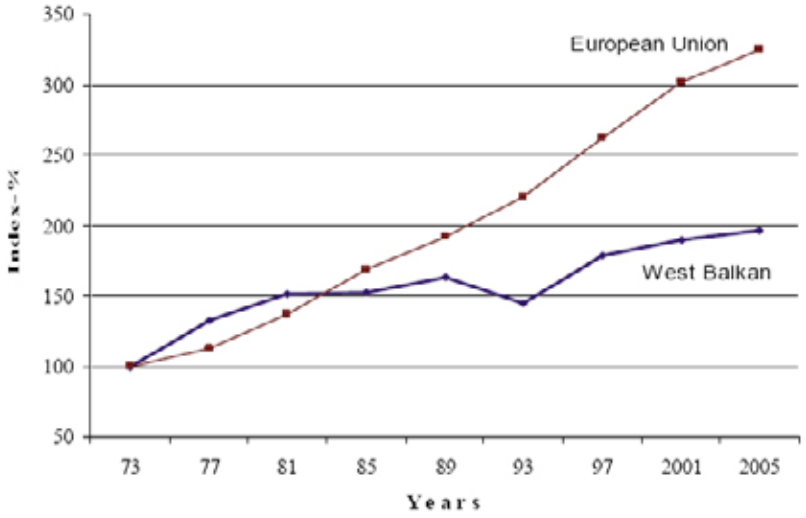
Source: Own calculations on the basis of FAOSTAT.

If we look at the countries individually, labor productivity is highest in Croatia, while Albania

6 As far as labor is concerned, the referential pre-transition period is represented by the last 16 years of the socialist era, i.e. the period between 1973 and 1989, while the transition period starts with 1989. Such division has been based on the FAOSTAT database.

holds the lowest level of this type of partial productivity (*Zekić, S., 2008, 57*). The increase in labor productivity is much more apparent in the EU-27, where the average annual rate of growth of agricultural production per active farmer is 3.43%, for a given period, compared to 1.67% in the countries of the Western Balkans (*Figure 4*).

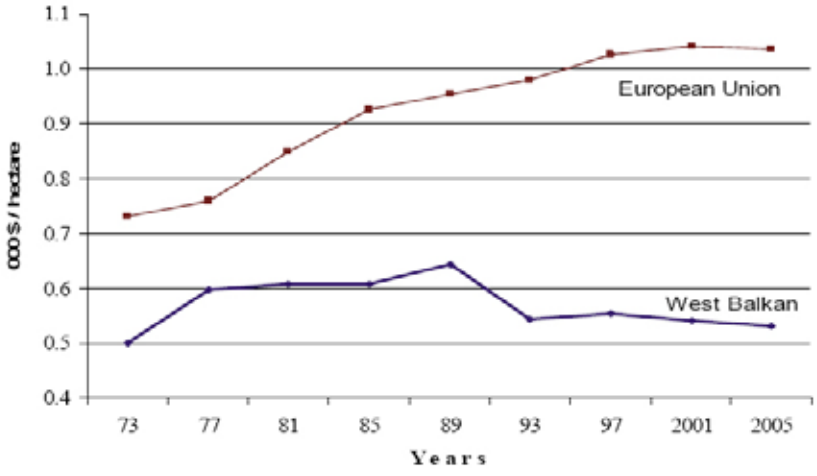
Figure 4 - Dynamics of labor productivity



Source: Own calculations on the basis of FAOSTAT.

As far as land productivity is concerned, the situation is somewhat more favorable in the Western Balkan countries, since the gap with the EU-27 is slightly narrower, i.e. 1:1.34 and 1:1.59 in the pre-transition and transition periods respectively. If fifteen old EU member states are included in the comparison, the gap is, naturally, a slightly wider, i.e. 1:1.58 and 1:2.10, for given periods, respectively (*Figure 5*).

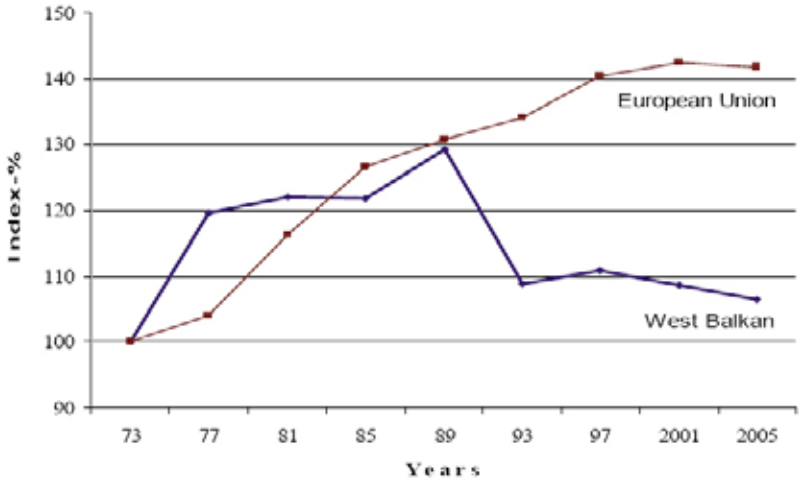
Figure 5 - Level of land productivity



Source: Own calculations on the basis of FAOSTAT.

Croatia, Serbia and Macedonia have the greatest volume of production per *ha* of arable soil, while Bosnia and Herzegovina holds the last position (*Zekić, S., 2008, 59*). However, in contrast to labor productivity, the level of land productivity in the countries of the Western Balkans has decreased during the period of transition, so that, in the given period of analysis, the average annual rate of growth is -0.05% or -0.54%. Although there has been a decrease in land productivity in the new EU member states since 1989, the EU-27 records the increase of 0.82% on average per year, for the given period, in this type of partial productivity (*Figure 6*).

Figure 6 - Dynamics of land productivity



Source: Own calculations on the basis of FAOSTAT.

Rural Economy Competitiveness

Farm producers in the Western Balkan countries will, sooner or later, find their place in the common EU market, where they will be exposed to strong pressure of competition from highly efficient producers from, first and foremost, and the highly developed countries of Western Europe. In the process of integration with the common EU market, the non-competitiveness of the agro-food sector in these countries, characterized by a low level of agricultural productivity, especially labor productivity, will induce high costs of production, i.e. price non-competitiveness of food products in the common agricultural market.

The low level of labor productivity is mostly determined by unfavorable resource structure in agriculture, i.e. by a relatively large number of workers in this sector, which is slowly shrinking due to insufficiently rapid development of the non-agricultural sector. The preservation of "over employment" in agriculture "is enabled" by high rural unemployment accompanied by the dual agrarian structure[7], which is predominant in the Western Balkan countries.[8] Such situation adversely affects the profitability of agriculture, diminishes the

7 On one hand, the dual agrarian structure is characterized by large commercial farms, while on the other hand there are small individual semi-natural farms.

8 The retention of a large number of workers in agriculture goes hand in hand with the current land policy, which on one hand forbids foreigners, sometimes even national corporations to purchase the land, and on the other hand "promotes" short-term and usually informal lease due to the weak legal protection of land lessees.

volume of investments and makes the increase in competitiveness impossible. The effects of high employment in agriculture in the Western Balkan countries depend, among other things, on the political influence of agricultural lobbies and rural population.

In the countries of the Western Balkans agriculture is still undergoing transformations, i.e. there are still traces from the former socialist economy which are to be overcome. The agricultural structure continues to be unfavorable, with a large number of small farms and co-existence of semi-natural and commercial farming sector. Rational application of agro-technical systems to small, semi-natural farms is not possible. This causes low labor productivity, which consequently cannot ensure adequate income.

Another problem in the agro-food sector in the Western Balkan countries is reaching EU standards, i.e. EU requirements concerning product quality. The application of EU standards will have two contradictory effects on the agricultural production and prices. On one hand, cheap, low-quality products will be excluded from the market, and they are still in demand by the poorer population, and partly by the export market in the "poorer" countries. On the other hand, the implementation of the standards mentioned above will have the opposing effects concerning the acceleration of restructuring and creation of more efficient agriculture and channels of food distribution, so that the first middle-term results will be seen in the countries with the low level of restructuring of the agro-industry.

In addition to the comprehensive restructuring process, agriculture in the region should be recapitalized so that production can be modernized and costs reduced. The problem is particularly noticeable in cattle breeding, which will have more difficulties in conforming to EU standards, while the level of competitiveness in plant production will be determined by high transportation costs and a lack of storing capacity. On the other hand, rural regions require faster development of "non-agricultural" activities, which would enable the absorption of the excess of labor force, which is unproductively employed in agriculture.[9] Within this context, the development of this sector for processing farm products, as well as agricultural input industry could play a "significant" role. These processes should be accompanied by the erection of an infrastructural network as well as raising the general level of services.

In order achieve necessary restructuring of agriculture so as to increase agricultural competitiveness, after the accession to the EU, the countries of the Western Balkans will be able to use relatively huge resources from the EU funds, such as direct payments. However, the important question is: what will be the level of such support at the moment of accession of individual countries to the EU and, what will be the outcome of pre-accession talks. Moreover, it is not certain to which extent will this kind of support be adjusted to the economic and social aims of transforming agriculture. In other words, there is a risk that directs payments will be absorbed by increased demand and increased land prices, and that they will result in consolidating the existing structure. This will slow down the process of restructuring towards reducing "over employment" in agriculture and solving the problems of high degree of land fragmentation. In short, direct payments can turn out to be inadequate instrument to obtain investments and social security in agriculture. During the pre-accession period, the countries in the region will be able to use IPA resources (*Instrument for Pre-Accession Assistance*) for their rural development, especially once they become candidates for the EU membership. Then, all five types of support will be available to them, including the support for the development of rural regions.

9 The development of non-agricultural activities in rural regions will ensure alternative possibilities for the use of labor, capital and land, as well as changes regarding the demand for these factors, which will be reflected in the structure of farm production (*Lovre, K., Gajić, M., Trkulja, Đ., 2007, 82*).

Conclusion

In the Western Balkan countries, the rural structure is far more unfavorable than in the EU countries, which largely determines the relatively low level of partial productivity in agriculture. This is especially noticeable in labor productivity. As a result, the level of competitiveness of the agricultural sector is fairly lower compared to the EU countries. Since agriculture represents the dominant economic activity in rural regions of the Western Balkan countries, the low level of the competitiveness of the agricultural sector significantly reduces the competitiveness of the rural economy as a whole, as well. Within this context, necessary reconstruction of agriculture is still far from completion. The problem of competitiveness is particularly noticeable in the sector of cattle breeding as well as in small semi-natural farms, which will have the greatest difficulties in the future common EU market. However, such farms are still of key importance for social security in rural regions, where semi-subsistent production represents the main factor of economic sustainability. In addition, rural regions require faster development of non-agricultural development, which would enable absorption of the excess labor force unproductively employed in agriculture. Within this context, the development of the sector for processing farm products as well as the agricultural input industry could "play" a significant role.

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PRESERVING AND ENHANCING SOLIDARITY AND THRUST CAPITAL IN THE COUNTRYSIDE. A SHORT ANALYSIS IN THE GENERAL CONTEXT OF AGRICULTURE BASED ECONOMY

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Abstract

It has become a well known fact that a sustainable development of humankind resides not only in preserving the environment but mainly in preserving solidarity between generations or within a generation. This sustainable development defined as a productive cooperation between generations implies a man nature relationship where the man is an element of nature not its master. The place where the interests of several generations come together as a hole is the countryside, for here the connection between nature, work and capital has a permanent and direct character. Therefore it is not by chance that man and land are primary components of a nation wealth. For the Romanian people eternity was born in the countryside, and the sacred aspects of life are better preserved here. In this context it is a priority to determine the real contribution that it has to Grass Domestic Product, the contribution it has to the preservation and augmentation of the national wealth, as basis for an increasing thrust capital.

Key words: rural solidarity, thrust capital, rural family, social dialog

Introduction

In the general context of amplified and diverse relationships between economic agents, of markets globalization and increasing level of national economies interdependences, the role of the social capital has gained new and meaningful valences. The wish to differentiate between different capital configurations has been stronger than anytime before. We consider that the main component of the social capital, in the context of what we presented so far, is the thrust capital. One can not define the thrust capital unless one considers the nature of the interests involved, as well as the relationships between individuals on one hand and the relationships between individuals and their community, The last ones should be considered taking into account all structures which govern in an hierarchical order of power, starting with individuals and immediate human collectivities (family, street, town, region, etc) and ending with the relationships interdependences generated by the existence of different economic spaces.

The existence of the thrust capital implies the generation of specific states where these interests exist and manifest according to their innate metabolism with no conditioning generated from the exterior. Those who have interests, whether they are individuals, families, communities, public authorities, economic agents, act mainly according to their own objectives which they tends to accomplish. The existence of such group of interests implies the existence of well determined principles which guarantee the gratification of the group interests as well as the general ones

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which result from inherent inter interdependence conditions. Therefore thrust must be established in the area of principles, of common values according to which one acts. The analysis of the thrust capital in rural communities is needed more than ever because agriculture is no longer the main economical branch sustaining the Gross Domestic Product in a market economy and because the countryside loses what it symbolizes. As a result thrust becomes the bonding element in rural communities. Placed at the junction between tradition and modernism, the rural space and especially the rural society have to face significant changes at the beginning of the XXI century. Built on the thrust between its members the rural community represents for any economy the image of solidarity and communion of interests.

The Impact of the Thrust Capital on Rural Communities

Economic development means, due to its essential coordinates, the existence and development of agriculture, because agriculture owing to its nature has contributed to the birth and consolidation of profound and ageless principles and values for the existence of each and every state. In this context, the rural communities established a strong relationship with the land-sacred element for any society- and a set of principles and values emerged, set which leads beyond the immediate need for survival into a sacred and eternal spiritual world. The rural community develops in time strong and profound relationships between its members. As a component of society the peasant is indissolubly connected to his family, his land, the church and neighbors, to the natural element which marks his personality. Concerned with providing him a decent living, identifying him with nature and the way nature works, driven by the hope of a better tomorrow, Thrust is the value in which all the peasants' hopes reside. Placed at the junction of modernity and traditional values, the rural community is nowadays exposed to the ever growing tendencies of renouncing to the activities which used to define it. The intrusion in the rural communities of the "urban virus" changes the former unaltered core of a society which is in search of its own values, due to the fact that these values are so often negated or replaced with imported ones. What those in power could not change for centuries is now done with no discrimination by appetite for gain. Why talk about the thrust capital when it comes to the rural community? Isn't it enough to perceive and display the peasant as the representation of what a society holds as sacred and valuable? Isn't the countryside the last line of defense for a society torn apart by financial or economic crises? Isn't it enough that the countryside offers the certitude of a life based on respecting towards nature fundamental social values?

Trying to answer these questions we unveiled the image of an environment taken from a reality which differs a lot from the urban space where we live. Without trying to idealize this environment, we set ourselves to analyze the group of interrelationships that are born, shaped and developed in the countryside by means of a sacred and eternal value, which gives cohesion to rural communities and allows them to display the current image of the peasant and of the countryside. Maybe more than ever thrust gets new and meaningful valences in the countryside, where everybody knows everybody, where the respect for life and nature is more vivid than anywhere else. Conscious of the impact he has on his community the individual in the countryside act in such a manner so that no harm is done to the balance between life and nature. The role thrust has in the mechanism of social alteration to which peasants and the rural community come under for a log period of time, had as a result their transformation into a dives generates rural continuity.

The impossibility to transform the thrust capital into a money based equivalent is not a restriction when it comes to turning it into the essential factor which leads to the development of interrelationships that manifest themselves in the countryside. The role of the historical

experience in determining and forming the thrust capital and of the major implications it has over the countryside as a whole. Related to the space-time relationship in the rural community a powerful thrust capital comes to life, having as background collective actions and thinking which will later control their actions. Therefore thrust has its source in the crystallization of a way of life specific for rural communities, based on the family, church and nature or land.

Benefiting from a capital superior to others- the thrust capital- a society may develop in harmony with its own values, setting the architecture an own socially and economically accepted model. Thrust, as a result, determines the establishment and the preservation of the relationships related to agricultural production and to the countryside social bounding (Figure 1).

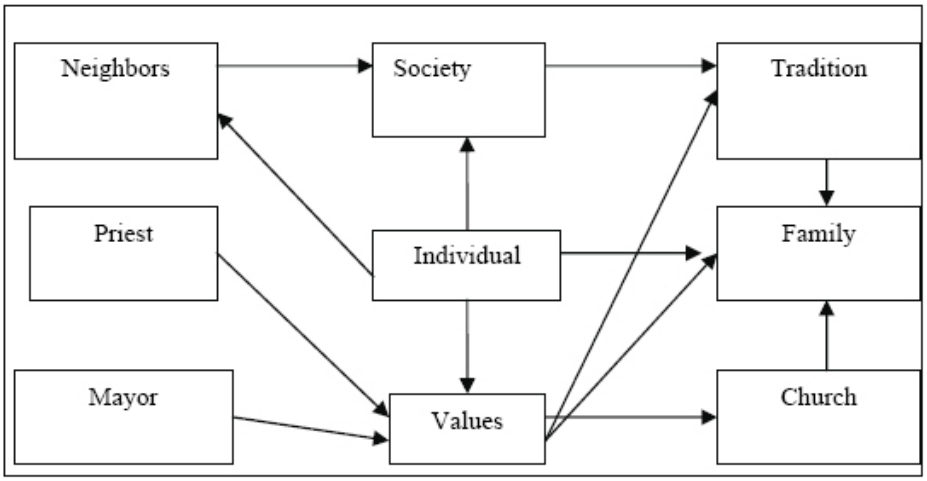


Figure 1 - The group of relationships determined by rural existence

Rural society represents more than a human community. The action environment gains new valences benefiting from the thrust existing among individuals. Thus tradition and family are place in the very core of the peasant's existence. The high level of cohesion which characterizes rural communities, marked by the thrust capital its members are enjoying, is subject to a constant process of alteration and dilution. We are witnessing the reconfiguration of the countryside according to new demands, a process which is characterized by a series of "significant ruptures", on one hand the rupture between the countryside and the demographic space- due to a migration from the urban to the rural environment which leads to the rarefaction of the existent thrust capital, an on the other hand a rupture between the rural community and the agricultural development pattern, due to use of methods and techniques of production which include elements incompatible with the traditional and sustainable production process. Having in mind the above, the impact of the thrust capital in the countryside can be analyzed taking into account many coordinates, respectively the property, the ecologic agriculture, the state intervention, and the role of society elite generation

The family private property - the base of rural trustworthiness

Besides family and tradition, property is for rural communities the central element around which the interpersonal relationships revolve, including the ones related to marriage and having a family „*What*

strikes you first when we are talking about the Romanians ownership rights is not a reminiscence of joint ownership, but the sense of rural solidarity, deriving from the common origin of all the village inhabitants, from the existence of one or more creators of land in the wilderness."[4]. In this context thrust is the one that puts together a community, making simple individuals into neighbors. More then anywhere else in the countryside the neighboring relationships gain an important significance because the neighbor validates an ancestral interconnection, he is the proximate element in the personal space of the individual, having the benefit of thrust and showing thrust.

Economic theory and practice illustrates the existence of numerous combinations of various forms of property, the most efficient structures being the ones which are mainly private. Referring to Romania, in non agricultural activities, we, in an overwhelming manner, mainly come across private properties based on partnerships, while in the countryside the property is individual or belongs to the family. Rebuilding and reactivating the thrust capital in rural collectivities from Romania can not be resumed to the reintegration of private property, even if this is a fundamental process which is still unfinished. In this context, it is necessary, *first of all, to revive the potential of family private property, so that it will ensure for each homestead, based on the family's work, an autonomous, dignifying existence*. As a practical example, the physical architecture of the property must be rebuilt: the home yard, the croft, the orchard, etc- as a condition for establishing self-confidence**.** On these premises the immediate good neighbor policy will be activated, and this will vivify the village's family- the basis of countryside solidarity. **Secondly,** thrust among countryside people is the foundation of free consent reunion of land, so that the three elements of working the land to be balanced. The three elements are: th**e** area where people have their homes, with all that is related to household work, the biological agriculture adjacent area which includes pastures, forests, reservations or spaces dedicated to tourism and the biological agriculture area in which besides the land used for crops there are included areas dedicated to animal breeding the industrial processing of agricultural products. **Thirdly** research and studies are necessary in order to improve the size of agricultural areas in terms of the involved factors, from which the following should not be absent: crop rotation, the efficient use of the technical capital, the existence of a circular and active process of the resources and production outcomes based on the organic junction of the agricultural, commercial, touristic activities and a relative economic-financial autonomy of the rural settlements, by means of substantial glut of the agricultural- commercial balance. **Fourthly,** the legal and technical process that governs the land leasing activity must come to an end because the peasant is willing at the most to allow somebody else to use his land. There are, when it comes to land leasing, some potential conflicts related to the establishment and the payoff of the lease, related to the rights and obligations of the parties and also to the leasing importance when it comes to agricultural costs and incomes.

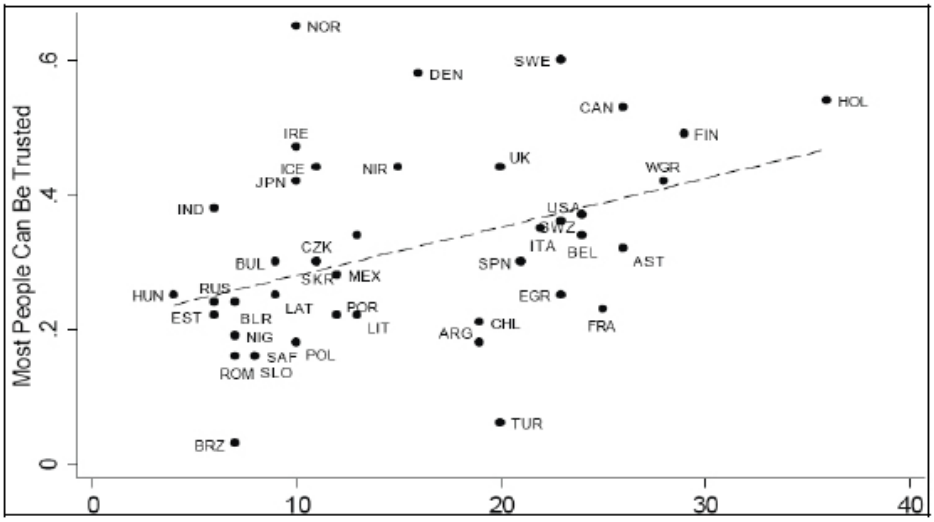
Democracy, rural solidarity development and post material values

Without detailing the primary role of the countryside, the role of rural solidarity in the development of humankind, we consider that we are living times when the agricultural economics play a decisive and primary role at least for the following reasons, the countryside reproduces, preserves and develops ethnicity, the liaison between ideas and life, and therefore it is the source of cultural diversity- an essential element when it comes to an efficient and constructive integration within a certain economic environment, agricultural economics it is the only branch that acts against entropy by producing more energy than it uses.

4 Iorga, N**.,** Anciens documents du droit roumain, vol. I, p. 3

The modern age, although it sustains the interrelations between different fields of activity, in order to have efficiency and proficiency imposes the **detail** as the central figure**.** As a matter of fact, to have a lasting and competitive production it certainly implies a number of variables, increasing in number, each, in the name of the system's proper functioning, becoming more and more important. In this context the rural development according to the native values of the rural society (Figure 2) will determine the preservation and augmentation of rural solidarity, because it involves at the same time all economic agents, all the people from the village, no matter what social and professional status one might have.

Figure 2 - Trust in people and post material values



Source: Eric M. Uslaner, *Trust and economic growth in the knowledge economy*, International Forum: The Role of Social Capital in Economic Revival of Japan, 2003, available at www.bsos.umd.edu/gvpt/uslaner, Accessed on: 12.10.2009

By augmenting the level of solidarity and thrust among the members of rural collectivities, the agricultural market will become functional, the producers will not stock products because the prices will be real, payments will be done integrally and in time, including the ones related to the state intervention. The force of rural communities, based on solidarity and thrust, will lead to equivalence between the prices of agricultural products and the industrial and service based ones, fact which will limit up to its disappearance the system of governmental subventions- element which is not compatible with the equivalence and the equality among partners. In this context presents a special importance the perception about the optimistically way of life for peoples on social levels and genders, which according to the table no.1 scores the lowest level for the second quarter of year 2008, from the individual point of view.

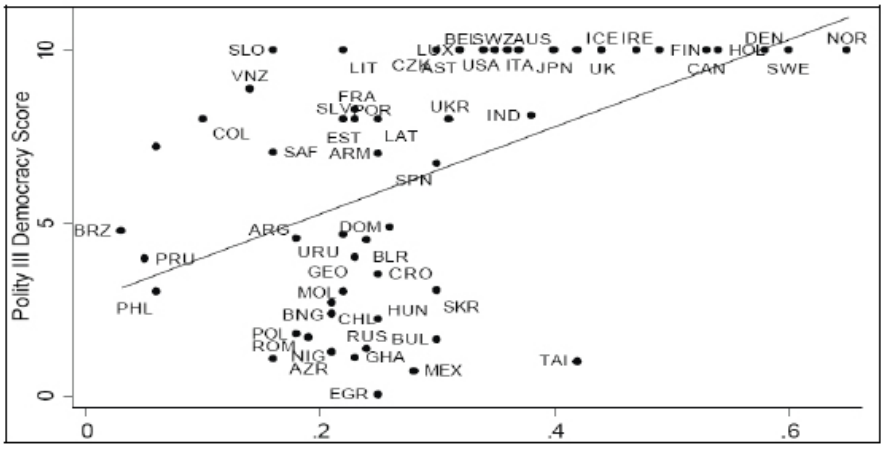
Table 1- The optimistically perception of life according to age and gender

Resident ship	Age	Gen	2008/1	2008/2	2008/2 -2008/1
Urbane	55 and +	Women	24	12	-12
Countryside	55 and +	Men	29	13	-16
Urbane	35-54	Women	39	30	-9
Countryside	35-54	Women	43	16	-27
Urbane	35-54	Men	44	33	-11
Countryside	15-34	Women	49	36	-13
Urbane	35-54	Men	50	36	-14
Countryside	15-34	Men	56	46	-11
Urban e	15-34	Men	63	37	-25
Countryside	15-34	Women	64	44	-20
Total			44	29	-15

Source: European Commission, Euro barometer No.70, and national report

The transition from a governmental governed economy to a competitive and sustainable market economy led to series of significant changes in the national economy as a whole, but also in the rural communities. The shift of power and decision from government to communities required the modernization and adaptation of decision making structures so that the mechanism to be closely related to traditional values system, specific to a certain area. This is directly related to the manner in which the local administrative elite comply with the cultural model. It will probably be a good idea to choose the local leaders from the people that were born and raised in the rural community. At the same time the rural leaders will determine a higher level of solidarity in the community and they will set the premises for a correct dissemination of local and national resources while facing a crisis no matter what its cause may be. To insist in state involvement as source of rural solidarity revival, it might be motivated by the fact that society, despite its constant reorganization especially in the field of resources and financial assistance, is a beautiful structure , but not a functional one when it comes to acting upon attitudes and behavior.

Figure 3 - Democracy and trust in people



Source: Eric M. Uslaner, *Trust and economic growth in the knowledge economy*, International Forum: The Role of Social Capital in Economic Revival of Japan, 2003, available at www.bsos.umd.edu/gvpt/uslaner, Accessed on: 12.10.2009

Numerous European barometers like Euro barometer no.70 emphases the thrust crisis which manifest itself at a global level. If we take into account the fact that the moral relationships among people are included in the thrust capital we may consider that the thus development strategy and solidarity depends on the cultural pattern. If we consider as reference the Romanian cultural model, we may state that the incoherent way of establishing institutional stability in the context of thrust capital development. As we previously emphasized, in the majority of states, there is a crisis generally related to the social capital, and to the thrust capital in particular the source being also the international financial crisis. The thrust status has significant alterations as it results from the table below.

Table 2 - The level of the main trust indictors for Romania and EU Macro regions in 2008

	Romania	**Bulgaria and Baltic countr.**	**East and Central Europe**	**South Europe**	**West Europe**	**North Europe**	**EU-27**
% complacent	47	49	73	69	84	89	77
% optimists	29	20	22	24	21	20	24
% trusting in justice	25	24	35	42	57	60	48
% trusting in Parliament	19	11	17	33	42	39	34
% trusting in EU	63	57	56	48	47	32	47
% concerned about monthly tax paying	57	65	45	60	37	37	46
% concerned about purchase power decrease	30	48	36	53	61	44	51
% concerned about the working place safety	32	40	28	40	18	18	26

Source: European Commission, Euro barometer No 70, and national report

There are still some significant reminiscences of the centralized leadership when it comes to the decisions taken in the capital city. It is not by chance that in Bucharest we come across the highest levels of incomes and investments and the lowest rate of unemployment. At the same time we believe that local autonomy, even though it has the support of democratically involved elements, should not be forced into existence in the context of limited resources. Having in mind what we previously mentioned, we may consider that the rebuilding of the thrust capital cannot be done simply by emphasizing the virtues of the local financial autonomy, but by employing of different kinds of founding mixtures, both central and local, investments provided by either regional, national or European founds.

Thrust is gained in time and it implies enormous spiritual and material efforts. In the 90's a former German Minister of Agriculture, criticizing the uncontrolled disappearance of common agriculture enterprises, emphasized the fact that in western countries it took 30 years of founding and rewording to create the architecture of medium sized agricultural enterprises, of around 50 acres. On the contrary, in Romania rewording measures for creating such medium sized enterprises is just a project, and when such rewording is done the process is not fully completed. For example the founds given as reword to buy agricultural devices did not have as a guarantee the production like in the western countries, but the land and the houses. As a result this type of founding was not well perceived by the peasants, because they considered it an attack towards life and what is sacred.

Conclusions

In the general context of agricultural relationships development, as well as the increasing role the rural communities play in the Romanian economy, **thrust** is the defining constituent of rural cohesion establishment. Theory as well as practice prove that preserving the rural solidarity leads to an enhancement of the thrust capital, this being the primary condition for national wealth development any time in the history of humankind. In this context, we consider that a nation can not step out in an era of globalization without respect for nature and furthermore the countryside and its communities. Whether we like it or not, we believe that the fourth wave, the contemporary one, accepting the other three waves identified by A Toffler, is probably connected to the first wave represented by agricultural economics due to cyclicity. Without detailing the primary role of the countryside, the role of rural solidarity in the development of humankind is great.

So the main conclusions of this working paper are:

- The countryside reproduces, preserves and develops ethnicity, the liaison between ideas and life, and therefore it is the source of cultural diversity- an essential element when it comes to an efficient and constructive integration within a certain economic environment;
- Agriculture is the only food source compatible with the human genome and the man the active and determinant factor of production is a part of nature and as a result man is bound to husbandry.

Therefore, thrust constitutes the bond among individuals, the premises for a sustainable development of the rural space as the recipient of tradition cultural values. Acting according to this primary criteria, land and tradition, the individuals turn thrust into the may mean of reaching success in their community. The Church and the family, two other fundamental pillars in a community, mark as well the individuals' existence in a community in a profound manner.

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THE ROLE OF THE EUROPEAN RESEARCH NETWORKS IN RURAL DEVELOPMENT

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Abstract

The present paper intends to present "a short history" of a young research network established a few years ago. The network has already a European cover and impact. Its activity was very intense and the results over expectations. Moreover, the cohesion among members makes possible the development of the activity for the future.

By this article we want to give an example of a "good practice" in this field. Could be an example for other networks, institutes, research centres and researcher of how an idea can become reality.

Key words: Europe, Networks, Rural Development, Experience

Introduction

The cooperation of the research institutes within the ERDN represents the continuation of a research idea launched by Dr. Gerhard Heilig and by The International Institute for Applied Systems Analysis (IIASA) from Austria.

One of the main characteristics of the rural development issue is its own complexity. The investigation of the current situation in the rural areas and their future development perspectives might be highlighted during the debates and experience exchanges among the researchers coming from different research institutes and who, most often, have different points of view.

The ERDN scientific network was established in 2002 in order to integrate the efforts and competences of different European and Polish Institutes with concerns in this field into a common activity, with common goals and specific means of action. It was an attempt to put together the research works of the researchers from different institutes under the same scientific coordinates, interested in the investigation of the rural areas, the changes produced in the 1990s, the consolidation of farms and the development of alternative activities, as a result of the new orientations at European level due to the EU enlargement and the common policies for future European development. In this way, the main ERDN objective focused upon the idea of establishing a European research network for agriculture and rural development. Through the development of the research activity in agriculture and rural development, both in Poland and Europe, with a special focus on the Central and Eastern Europe, ERDN tried to be in line with the European orientations in this field.

The Institute of Food and Agrarian Economy was designated to be in charge of the coordination of the ERDN activity and of reaching the objectives set up at the moment when the network was established.

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ERDN goals

At the moment when the idea of developing this research network was launched, certain main goals for the development of future activities were set up. We shall list some of these objectives, which lay at the basis of the first steps in the cooperation:

- The development of a vast cooperation basis between the Polish and European research institutes, within the EU enlargement process, dedicated to the analysis of the Member States, of their development level, of the perspectives and strategies of action for rural area development;
- The integration of the efforts and competences of the different Polish and European research institutes under a common activity of rural area investigation;
- Experience exchanges and promoting the individual results and output of the members in the network under the established scientific framework;
- Development of international scientific cooperation in rural development, mainly the development of cooperation in those areas of European interest while focusing the efforts upon the EU framework programs (FP6, FP7);
- The development of this initiative through the establishment of a research network of European level, which should put together specialists from different fields of activity, such as: economy, agronomy, sociology, geography, computer science, etc.

Membership

The research network has six founding members, all of them from Poland. The coordinator of the research network is the Institute of Food and Agrarian Economy - Institute of National Research from Warsaw (IERIGZ-PIB). This institute (www.ierigz.waw.pl) is an independent institution, authorized by the Ministry of Agriculture from Poland; it participates to common projects with this ministry and it has both budgetary and extra budgetary funding.

Other institutes as founding members:

- Institute for Land Reclamation and Grassland Farming (IMUZ) from the locality Raszyn - Poland (www.imuz.edu.pl);
- Institute of Soil Science and Plant Cultivation (IUNG) from the locality Pulawy-Poland (www.iung.pulawy.pl);
- Institute for Building, Mechanization and Electrification of Agriculture (IBMER) in Warsaw-Poland (www.ibmer.waw.pl);
- Institute of Geography and Spatial Organization - The Polish Academy of Sciences (IGIPZ_PAN) in Warsaw-Poland (www.twarda.pan.pl);
- Systems Research Institute - The Polish Academy of Sciences (IBS-PAN) in Warsaw-Poland (www.ibspan.waw.pl).

Besides the founding members, there are also associated institutes to the network, six in total, two from Austria and one from Romania, the Czech Republic, Slovakia, and Lithuania. These are:

- Federal Institute of Agricultural Economics (AWI) from Vienna – Austria (www.awi.bmlfuw.gv.at);
- International Institute for Applied Systems Analysis (IIASA) from the locality Laxenburg – Austria (www.iiasa.ac.at);
- Lithuanian Institute of Agrarian Economics (LAEI) from Vilnius- Lithuania (www.laei.lt);

- Institute of Landscape Ecology - The Czech Academy of Sciences (UEK) from the locality Ceske Budejovice - Czech Republic (www.uek.cas.cz);
- Institute of Agricultural Economics (IEA) – the Romanian Academy, from Bucharest, Romania (www.ince.iea.ro);
- Institute of Geography – The Slovakian Academy of Sciences (SAVBA)) from Bratislava - Slovakia (www.savba.sk).

Other countries participating to the network: Estonia, Latvia, Finland, Sweden, Netherlands, Germany, Denmark, Greece, Great Britain, Hungary, Russia.

Activities and results

Under the common activities of ERDN, several proposals for projects have been already formulated, and the applications were sent for assessment to the commissions for the Community projects selection. These funding proposals had the acronym INCAL and SOFAG. Furthermore, the international working meetings, which were periodically organized, had the mission to strengthen this cooperation and to enlarge the perspectives for new proposals and common themes. The network members were regularly informed about the results of the scientific meetings. These results were easily disseminated to the members by Internet, as well as by other active or potential partners.

For the organization of most meetings and actions proposed through the network statute at its establishment and mentioned in its main objectives, ERDN received financial support from the Polish Scientific Research Committee, under the research program "The International Cooperation under the form of scientific networks - Rural development in Central and Eastern Europe".

At present, the network is making great efforts for the identification of the research fields and themes in the strategic rural development area, together with all its partners, and at the same time for attracting new foreign partners. Since its foundation, the network was enlarged from six partner institutes to 20.

In its short history, in the period 2003-2008, ERDN organized six international conferences, to which all the founding members, associated members, collaborators or potential members were invited. The six conferences were organized in Poland, Lithuania, Romania, Austria and had the following themes: "Alternatives for the European rural areas" (2003), "Changes in the functionality of rural areas from the Baltic countries" (2004), "The rural development capacity in the Carpathians in Europe" (2005), "Endogenous factors stimulating rural development" (2006), "Values and challenges in designing the European rural structures - Research networks experience" (2007), "Multifunctional Territories: Importance of rural areas beyond food production" (2008).

The results of the conferences, the scientific papers presented by the participants were published in a volume that was distributed to the members and the interested research institutes. The works presented and debated during the meetings were also published on the Internet, on the web page designed and dedicated exclusively to the activities of the network (www.erdn.waw.pl). Until the present moment, four volumes under the ERDN logo were edited, under the titles of the conferences mentioned above. The following can be listed among the most important works presented and published in the above-mentioned volumes: Main problems of agriculture and rural areas in Poland in the period of transformation and integration with European Union, Transforming the functional structure of Poland's rural areas, Rural space and rural development in Romania, Regional future scenarios for

rural space types in Austria, Information society and the countryside: can internet-based systems bring income alternatives to rural areas?, Role of tourism in the development of rural marginal areas (region of Šumava Mts. in Czech Republic), Distribution of income in Polish agriculture, The changes in and the spatial patterns of Polish agriculture (for the volume "Alternatives for the European rural areas"); Developments of rural economies in the Central and Eastern Europe: an overview, The development of non-agricultural economic activity in Poland's rural areas, Social, economic and demographic changes of rural areas in Lithuania, Danish rural areas: recent experiences and future trends, Future perspectives for sparsely populated areas in Sweden, Changes in population and industries in the rural areas of Finland: from analysis of administrative regions to a GIS based approach, Web-based functionality of Polish self-governmental units and its effectiveness in promoting the development of rural areas, Structure and evolution of landscapes in connection with strategic planning of development of rural areas - on the example of the Slavsk area in the Kaliningrad district (for the volume "Changes in the functionality of rural areas from the Baltic countries"); The EU-Rural development policy in Austria, Lagging rural areas in post-socialist Hungary, Demographic changes of rural population in Slovakia, Unemployment as a reason of social exclusion – spatial analysis for Poland, Major changes in the Hungarian micro-regions, Romanian rural development and foreign direct investments, Agricultural markets in the new member states – development of agricultural production in Hungary, Land use and ownership and the Czech farm development, Agricultural engineering in the ecological mountains farms (for the volume "The rural development capacity in the Carpathians in Europe"; Public goods and rural development in Poland, restructuring in sparse regional structures – a Swedish case, On human capital and agrarisation in Poland, Existence and quality of Slovak rural municipalities' websites – the differentiating factor of rural competitiveness, Challenges in preparation of regional rural policy programme for 2007-2013 – the case of Raache sub-region, Finland, Evaluation of educational measures of the Austrian rural development program - results and experiences, Human and social factors as endogenous factors stimulating the Leader programme in Hungary, Endogenous rural development prospects in mountainous areas: the case of mount Parnonas in Greece, The role of Water Framework Directive in the development of rural areas (for the volume "Endogenous factors stimulating rural development").

ERDN perspectives

Through its initiatives, ERDN attempts to focus its efforts on the following directions of action:

- Finding other common research themes and their getting in line with the themes of European interest;
- Participation with applications to international projects, mainly those with European financial support;
- Strengthening the cooperation through the design of common research papers by joint research teams under the network, the participation to international scientific events, the organization of common scientific activities;
- Attracting new members into the network;
- Periodical editing of a network journal, other than the annual publication consisting of the works of the network conferences, or the development of an on line publication;
- Organization of an international conference in each of the member countries (in

the year 2009 the conference took place in Hungary, Debrecen and the title was ”Linking competitiveness with equity and sustainability: New ideas for the socio economic development of rural AREAS”).

The Conference aims to stimulate theoretical and empirical discussions on current and possible new approaches to promoting competitiveness, equality and sustainability in rural areas in different regions and nations. Economists, social scientists, policy makers, and natural scientists are invited to enrich the discussion from different perspectives.

Rural areas themselves, and our understanding of how to most effectively support their development, are in a process of dynamic development. Economic development must promote human well-being. The conference topic aims to address many experts of different disciplines; thus the organizers invited prospective participants to adopt an interdisciplinary approach. Contributions to the conference deal with:

- developing the natural, human, social, physical and financial capital of rural areas,
- the contribution of rural areas to regional development,
- the potential for knowledge-intensive employment creation in rural areas,
- political approaches towards linking competitiveness with sustainability and sustainability with competitiveness
- community perspectives on the socio-economic development of rural areas.

The key issue underpinning this process is that the historic role of agriculture in rural areas as sites of feed, food and fiber production now represents only a part of their social and economic fabric. It is now widely accepted that beyond agriculture, which also provides new products such as fuel and feeling, the different capitals of rural areas (human, social, natural, physical and financial) offer additional opportunities. This, however, has led to the view that rural development policy should focus on “sustainability” whilst of urban areas should emphasis “competitiveness”.

Just like their urban counterparts, rural areas have human, social, physical and financial capital, not just natural capital. These capitals, when properly developed and exploited, can allow rural areas to contribute fully to the competitiveness of the regions in which they are embedded, thus aiding their prosperity and attractiveness as places in which to live. Both in rural and in urban areas, therefore, competitiveness and sustainability should be developed in parallel, consistent with the objectives of the Lisbon Agenda and the Göteborg Strategy, in a managed way that ensures equality of opportunity for all communities.

EU perspectives

The legal basis is Article 66 (3) of Council Regulation (EC) No 1698 /2005, as well as article 68 and 39. The national network is funded by the technical assistance of rural development programm; Member States with regional programm may propose a specific programm to run the national network.

The main objectives and duties are:

- To group the organizations and administrations involved in rural development
- There is a general duty to facilitate at Member State level an exchange of expertise and support implementation and evaluation of the rural development policy and to secure and coordinate the information flow between the local, national and European level.
- The action plan contains at least transfer of knowledge (identification and analysis of good

transferable practices and the provision of information about them, the organization of exchanges of experience and know-how) training (the preparation of training programm for local action groups in the process of formation)

The structure needed to run the network may be established either within the competent national authorities or by selection through tendering procedures. That structure must be able to perform the tasks described in the action program. The structure must have the sufficient staff with international skills to be the contact of the European Rural Network and other national networks and to provide the support to transnational cooperation.

Member States have the responsibility to adopt the necessary structure. The following bodies are recommended:

- A permanent secretariat to manage the network (National Network Unit);
- A coordinating committee grouping the main categories of rural actors (organizations representing the categories of beneficiaries of the programme or third parties concerned by the objectives of measures) and the administrations;
- Thematic networks: they can be targeted enough to be of direct interest to actors and act as a strong incentive for their participation around common issues. At the beginning of the programming period, thematic sub-networks could determine the global process and introduce in a progressive manner a way of working together. The thematic networks would then have to widen the range of issues being developed in order to avoid division and allow for a general exchange of information and experiences. Rural actors concerned by the programm are according to the measures implemented:

Axis 1 and Axis 2: vocational training organizations for agriculture, food and forestry sectors; the farmers associations including young farmer organizations; producer groups associations and associations of cooperatives in agriculture and forestry including quality producer groups associations in agriculture; chambers of agriculture, network of advisory services for agriculture and forestry, forestry owner associations, food and forestry processing industry associations, land management agencies, energy and water supply organizations, mountain farming organizations, Natura 2000 network, environmental NGO, agro environment technical and scientific institutes, animal welfare NGO.

Axis 3: Chambers of trade and industry in rural areas, rural tourism organizations, landscape and environmental protection organizations, cultural heritage organizations, vocational training organizations.

Axis 4: local action groups and their informal networks.

Administrations concerned are: Regional and national administrations involved in the implementation of the programmes, other administrations concerned by rural policies, national association of rural communes.

Two options are possible for the establishment of the National Network Unit: It could be set up within the administration or outsourced totally or partially via one or several contracts (the more probable case in reality as normally administrations will not have animation capacity).

Several tenders might be needed to implement all tasks mentioned in Article 68. In such cases a coordinating function by the national administration or left to the contractors to manage the network is needed.

Technical resources that are essential for a good functioning and efficiency of the networks include:

- Information technologies: a good system for internet site (multilingual) and databases;
- Contacts with wider rural development networks, research institutes, resource centers, political spheres, etc. to be able to develop a horizontal approach to the (rural development) network.
- Good knowledge of European languages, cultures, contexts and history are put forward as being important since only they can lead to the creation of easy, professional and long-lasting network of people at the European level and be useful in the identification of potential partners needed by local actors or when bringing support to cross border projects.
- Expertise should be available 'inside' the network and the networking unit as well as outside to complement the internal skills:

Expertise/ skills on all themes related to rural development are needed:

- For animation (of a network being both bottom up and top down)
- To communicate (inside the country but also outside)
- On editorial matters
- For marketing
- For public relations advice
- To organize events
- On cooperation
- On evaluation
- For training
- On applicable action research, academic know-how which is based and rooted in practical expertise at ground level
- For counseling
- On administrative matters and procedures.

Human qualities: the staff of the networking units ought to have an accessible approach, show enthusiasm for the network and the projects developed by the actors, be service orientated, have a strong team spirit etc. A good team Leader is essential.

Networking needs are continuously changing. The networking units ought to keep in mind this need for evolution, not only in terms of technical resources they use or develop, but also in terms of the available human resources.

The European Rural network and the national rural networks should use common tools in the tasks related to identification of good practices and support to transnational cooperation. These tools should be included in the action plan from the beginning and will include:

- Project database based on the use of a common pilot project form (elaboration of list good and best practices)
- Transnational project database
- Expert database
- Local action groups database based on the use of a common LAG form
- Transnational cooperation partner-search tool.

This multi-national partnership between organizations of the civil society has a clearly defined goal, that of strengthening the civil society in the rural areas, and to promote intra- and trans-national cooperation in this field. Within this context, the National Rural Development Programme (NRDP) will gather actors from different sectors, and will have a crucial role, since it contributes to the improvement of communication between the participants to rural economy. The National Rural Development Network will contribute to stimulating the establishment of active partnerships between the public, private, and non-governmental sectors, in this way bringing together the representatives of the local/central public authorities involved in rural development, local communities, institutions, interested NGOs (professional associations, foundations), etc. The success of rural development will greatly depend on these partnerships. Consequently, the National Rural Development Network will have to be formed and administrated in a manner that is open, dynamic, and accessible to all those interested and involved in the areas of rural development. The existence of a network of public and private organizations (NGOs) in Romania, active in local development, some having experience in the development of certain European programme or development projects, that may rapidly engage in the development of rural communities, may represent the starting point for the creation of a National Rural Development Network that will evolve in time and within which several mutations shall appear, in different directions, as far as the range of subjects, participants, and performed actions are concerned.

The principal role of the Network is to facilitate the exchange of experience, to support the implementation and evaluation of the Rural Development Programme, and to ensure the information flow between the local, national, and European levels. The mission of the Network comprises a *strategic component* – for the establishment of the main directions of action of the Network (the collection and dissemination of information concerning the programmes and rural development policies at the local level; the superior capitalization of the actors' competences; rural development in general) and a *technical component* – for the implementation of the strategic elements (setting up a data base, a guide, a website, the organization of seminaries to foster communication and transparency; consultation services directly addressing the beneficiaries).

The activity of the Network shall be coordinated by a National Rural Development Network Coordination Committee, while at the regional level, resource centers (transmitters) will be established, supporting the actions of the respective committee by maintaining permanent contact with the local beneficiaries.

The action plan will encompass at least the following:

- The identification and analysis of the best practices and information as far as these are concerned;
- The management of the network;
- The organization of exchanges of experience and know-how;
- The preparation of training programms for the formation of Local Action Groups;
- Technical assistance for cooperation;

In the afferent calendar, the stages of the working plan for NRDN are presented, as follows:

- The identification of the actors involved in rural development;
- The elaboration of the Terms of Reference;

- The elaboration of the procedure for the selection of the Network administrator;
- The identification and establishment of the components of the National Rural Development Network Coordination Committee;
- The launching of the call for proposal;
- The submission of the offers to participate in the selection;
- The selection of the organization that will administer the Network;

Conclusions

The idea of a European rural development network is relatively new and that is why the work and preparations are intensive and on going. Thus, from many points of view, we cannot see too many results from the effort done. But, the general agreement is that we need a rural development network at European level.

From our examples we can conclude that the things are moving on the right direction in many countries but the level of development is different. In the same time, we can say that the perception of this idea is almost the same for all structures but the involvement of the actors in the construction of the network is different. Of course, everything depends of their interest and capacity of reaction at the market and development needs.

There is a legal basis at European level, there is a general legal frame in each country and, in the same time, there is a big availability from many European institutions to built and develop this idea.

Instead of too many conclusions and recommendations we will shortcut by a few words: inclusiveness, valuing people, bottom-up approaches, sustainability, best practice, knowledge base, synergy, community, empowerment, outward looking, openness, learning, strengthening rural and remote communities, holistic approach and equal opportunity regardless of race or creed.

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"SOCIAL AGRICULTURE": A PATTERN BETWEEN FARM INNOVATION, SOCIAL RESPONSIBILITY AND MULTIFUNCTIONALITY

Maria Carmela Macrì[1], Maria Angela Perito[2]

Abstract

Rural context and agricultural process are assuming growing credibility as a mean to promote well being and social inclusion in the population as a whole.

Fattoria solidale del Circeo" constitutes one of the many examples of social agriculture that have risen in the recent years in Italy. Differently from the general case, it is a large farm which is moving from a conventional an intensive farming system to another model, without abandoning its entrepreneurial nature.

Even if it is not easy to assign a theoretic paradigm, it could be useful both in order to understand it and to give correct instruments to policy makers. So we can try to put the Fattoria Solidale del Circeo's experience in a theoretic context.

It seems to us that at least three different models can be applied: the well-established Schumpeterian model of innovation; the Corporate Social Responsibility, the Multifunctionality of agriculture.

Key words: Social agriculture, Innovation, Corporate Social Responsibility, Multifunctionality of Agriculture

Introduction

Rural context and agricultural process are assuming growing credibility as a mean to promote well being and social inclusion in the population as a whole. We do not refer only to the countryside capacity to improve individual welfare because of the slower and relaxing lifestyle, we refers to specific experiences developed by some farms in supplying social and health services. In Italy, role of agriculture in social and sanitary processes is not news: agriculture has been used for at least 30 years in social inclusion trail in the case of drug dependency and more recently it has been used in psychiatric department as a support in therapy. However, now the range of social services supplied by farms is widening and, at the same time, agricultural policy has started to support farms which supply social and health services, namely project of labour training for disabled people (especially mentally deficiency); didactics visit for school children; "green cares" such as horticultural therapies. Even if "social agriculture" has not yet a juridical framework in Italy, at least two important planning documents mentioned it: the rural national strategy plan, produced in the context of rural development policy and the programme "Guadagnare Salute" approved by ministry of Health in 2007. In the latter it is hoped that rural development policy takes in account the aim to develop healthy activities for population also trough social agriculture.

On the other side, Italian National Strategy Plan considers "social agriculture" as a possible mean

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of farm diversification beyond to be an opportunity to improve quality of life in rural areas. More specifically, strategic plane considers interesting to promote and support the increasing trend of farm to implement private enterprises which develop practices addressed disables, weak and socially excluded people.

Different practices and different juridical frameworks

Many activities can be considered under the category of "Social agriculture". These practices may be very different each others, except for the fact that every of them is based on natural resources and rural context. It does not refer to a passive experience of the beauties of the countryside as it happens in the agro-tourism. It deals with the use of the vegetable and animals as a tool in different kind of social services (therapeutic, rehabilitative and social integration activities) because of the persuasion that natural cycles and rural rhythm have a thaumaturgical attitude.

A part of the possibility of overlapping, we can group the Italian experiences under a few different categories according to their prevalent ambit of action (Di Iacovo, edited by, 2008). The grouping on one side implies a simplification which reduces the complexity of the real situation, on the other side is useful to supply a briefly presentation of this world[3].

The groups are:

Professional training and labour inclusion, directed to low bargaining people (disabled individuals, ex drug-addict, detainees, etc) where agricultural creates the opportunity of employment and income for disadvantaged people;

Recreation and quality of life, which are mainly "not for profit" activities, often managed by municipality which give little allotments to elderly people with the aim to create opportunity both to enjoy oneself and socialize with the neighboured;

Education, that is actions to improve knowledge of agricultural practices and rural culture and to develop the environmental sensitivity in the new generation (garden in the school managed by the schoolchildren, educational farms, etc.);
Services to population in rural areas, such as kindergarten, summer reception for children, elderly home. Since lack of services, together with the low job opportunities, is one of the most important reasons of depopulation in rural areas, this opportunity seems particularly interesting on the point of view of the local development dimension;

Rehabilitation and therapy, where socio-sanitary professionalism prevails. Agriculture is a tool to improve the welfare of individual with some kind of problems (generally psychiatric). Agricultural activities could be carried out in sanitary structure or in farms which supply their resources and expertises.

From the normative point of view, social agriculture often finds a settlement in the field of social cooperation[4]. More specifically, agriculture could have a passive role being part of a

3 A wide description of Social Agriculture is available on the "Social Services in Multifunctional Farms" (So Far) project's website: http://sofar.unipi.it.

4 According to law381/1991, the social nature of the cooperatives in Italy – which implies some fiscal facilities– could be linked to the object of the services supplied or to the characteristics of their members. So they could be: "A kind", which supply educational, social and sanitary services; "B kind", which have the aim to improve the opportunity to work of disadvantaged people. In addiction the cooperatives could be a mix of the two typologies.

wider therapeutic project because of the "thaumaturgical" power of the rural context. This is the case of the Animal Assisted Therapy with or horticultural therapy (Sempik, 2007).

Another is the case in which agriculture constitutes the business of social cooperative and it grants the opportunity of employment and income for disadvantaged people[5].

In Italy, cooperative is a consolidated normative framework for the social agriculture, as well as for the "social oriented" activities in general. Further this typology social agricultural could be implemented both by public bodies and by "for profit" enterprises, but often it implies some kind of agreement between public and private sector (table 1).

Recently, new opportunities could rise from the decree n. 155/2006 which acknowledges the social enterprise as the firm which does not pursue the aim of profit but social welfare improvement. This new rule could produce an improvement in the social activity in agriculture as well as in other sectors.

Table 1 - Main kind of social farming experiences in Italy

Kind of organisation farm	Kind of activities	Position of organisation/farm	Position of disadvantaged persons
"A" social cooperatives (non for profit enterprises)	care farming, education	providing care services' or education; care is paid by social/health public bodies (daily fees); education can be paid by diverse institutes; obligation: no profit	public services' users; can be also members of the cooperatives
"B" social cooperatives (non for profit enterprises)	labour integration; socio-therapeutic integration; training; socio-recreation	doing business in agriculture (and other sectors) as a means of social inclusion; opportunities: subsidized contracts, tax relief, systems of agreements for adjudication of jobs; obligations: no profit, minimum 30% of employed disadvantaged persons	can be regularly employed, trainees or volunteers; can be also members of the cooperatives. In case of socio-recreation can be paying users/ participants
Private farms (for profit enterprises)	training; socio-therapeutic integration; labour integration; socio-recreation	doing business in agriculture for profit; opportunities: human resource for labour, subsidized contracts, (other indirect advantages).	can be trainees, volunteers or regularly employed. In case of socio-recreation can be paying participants/ users
Public Institutes	care farming; socio-therapeutic integration; training	providing care, education, rehabilitation; being involved in research or other activities in the fields of agriculture and/or social/ care	can be users, be engaged in rehabilitative, research or educational programmes, volunteers, trainees or else.

Source: Di Iacovo, Pieroni, 2006

5 About 30% of the "B Kind" or mix cooperative is active in the agricultural sector.

A case study

"Fattoria solidale del Circeo" constitutes one of the many examples of social agriculture that have risen in the recent years in Italy. At the same time this experience is particularly interesting because, differently from the general case, it is a large farm which is moving from a conventional an intensive farming system to other model, without abandoning its entrepreneurial nature.

The farm was established in the Pontina Plane to the South of Rome in the XIX century and it witnessed to great natural and social changes. In fact the area was a marsh which has been reclaimed during the Fascism regime. After reclamation productive organization of the area changed from a marginal model linked to the traditional *transhumance* to a very intensive and modern exploiting of land. The farm has been managed by the same household for four generation and the family was always able to readapt its business to the new environment over the time.

Nowadays, social demand towards agriculture is being enriched by new expectations from agriculture activities and rural context. This fact gives to actual young holder – Marco – the opportunity to combine his entrepreneurial attitude with the attention towards the disables. For a long time he has given voluntary services within an organization for disables. There he could notice that disables' capabilities were probably unevaluated. In fact they were engaged into a lot of activities but to work. On the contrary he was sure that they could be able to do some kind of jobs. After he became the holder of the farm, in 2004 he invited some disabled persons to work in his farm during summer period. In this first experimentation 40 persons were involved in different productive phases according to their abilities.

During this experience, both disables and their voluntary assistants were accommodated in one of the building within the farm. In fact, together with the 150 ha of land the farm includes some buildings and even a little chapel. Since the farm is specialised in dairy, that is a low labour intensity activity, some vegetables were planted to give the guests the opportunity to do a simple, not dangerous cultivation with a short productive cycle. So they could have the possibility to see the concrete results of their work. In addiction to farming simple conservation process had been done in order to give the opportunity to participate to people unable to walk.

On the very beginning, Marco had an entrepreneurial approach that is he was immediately oriented to economic self-sufficiency. In fact he registered a brand "Splende il Sole!" (Sun is shining!) which made it clear that the products involved disabled people's work.

After the products were carried on the market, it seemed clear people prefer "social products" among others but they are not willing to pay a higher price. As a consequence Marco decided to concentrate on high added value and labour intensive production such as ready-prepared fresh salads. On the same time he turned to direct selling and created an organised purchasing group, which is a group of people looking for ethical consumption.

Together the feasibility of the project, the test demonstrated the existence of some needs. First of all the necessity of training on the agricultural practices. Assistants have to do training as well as disabled people. Otherwise sanitary operator was not able to valuate neither the dangerousness neither the potentiality of the agricultural practices for disabled people.

Training has become an important part of the Fattoria Solidale's activity, further the necessity of its own projects. Many experiences were born which gave also the opportunity of collaboration with local professional schools. After this positive experience he decided to set up a professional training activity for disabled. The two years course is now going to finish and some people will be employed in the farm. The farmer, together with a specialised

pedagogue team, is now planning other activities in the field of social services. One of the most interesting features of this experience is the owner's strong will that social services achieve an economic self sufficiency so that they could have continuity without weighing on other farm's activities or depending on public support.

Some possible theoretic frameworks

Social agriculture is a spontaneous phenomenon which is not easy to put into a theoretic paradigm. Agricultural economists are trying to understand in which of their categories they have to allocate these experiences with the purpose to suggest instruments to policy makers.

So we try know to put the Fattoria Solidale del Circeo's experience in a theoretic context.

Generally speaking social agriculture can be trace back to, at least, three different models. They are the well-established Schumpeterian model of innovation; the Corporate Social Responsibility and the Multifunctionality of agriculture.

Social practices in agriculture need of a double kind of professionalism: agricultural and social expertises must interact to conceive actions and adapt them to specific context and requirements. At the same time, this is a very new field and protocols do not already exist. As a consequence these practices are always very specific and farmer's ability to innovate is a key element for their successful implementation. As usual, attitude to innovate is the main incentive for survival and expansion of business and – in a wider perspective – for the general development of society. Entrepreneurs introduce innovation to look forward to improve their earning and, doing that, they also improve collective welfare. On the other hand, since we are talking about private enterprise, it is important to consider that each experience must be remunerative, and so self-sufficient. In a capitalist system profit-seeking is the drive behind the economy. Social agriculture could be interpreted as a product innovation to meet the new demand rising from the post-modern society.

On another point of view, in the Corporate Social Responsibility (CSR) approach, profit is conceived in a new way. It is not still strictly related to firm perspective but it must involve other expectations. In fact, in the CSR profit maximisation is still considered the main motor of the economy but entrepreneurs must limit themselves in order to consider also other stakeholders' needs. Widening the meaning of profit is considered necessary to prevent social conflict and, definitively, to let capitalism survive. In fact, conflicts are perceived as intrinsic to capitalism and without a new ideology able "to widen the definition of capitalism from being economic-specific, to include the social and environmental" issues, capitalism will fatalistically destroy itself (David Birch, 2003). Social agriculture could be interpreted as a tool to involve social concerns in the purposes of economic activities.

Finally, since we are in the context of primary sector, Multifunctionality of agriculture can constitute a specific theoretical framework. Multifunctionality refers to the specific capacity of agriculture to supply benefits beyond its ability to be remunerated for them. This happens because of the presence of jointed products. More specifically, according to the "working definition" of OECD (2000), two key elements concur to the definition of Multifunctionality: "the existence of multiple commodity and non-commodity outputs that are jointly produced by agriculture; and the fact that some of the non-commodity outputs exhibit the characteristics of externalities or public goods".

Social agriculture supplies externalities because it contributes to quality of life in rural areas and in this way it could play a part in prevents their depopulation. In fact scarcity of services in rural areas could be one of the factors which reduce their viability. At the same time, development of social agriculture, because of its multidisciplinary nature also feeds local

social capital, which is a public good.

The definition of the theoretical framework is not a pure academic exercise, but it is necessary to individuate which role must be attributed to policy maker. In the case of innovation, public intervention must support the general contest in order to create a good environment for the development of the farm.

In the CSR context, the main problem is the "information asymmetry". It deals with the situation in transactions where one party has more or better information than the other. This creates an imbalance of power which can sometimes produce a "market failure", that is the transactions does not occur as in the case of adverse selection (Akerlof, 1970) or it results unfair. In this case the role of State is to grant the transparency on the market, so that the farm does not boast a virtuous behaviour without reason.

Finally, if we are considering the case of the Multifunctionality of agriculture, it will be necessary to support the producing of good externalities or public goods (such as social well being and cohesion).

Conclusion

After the brief review of the possible theoretical approach, we can compare our case study to it.

Fattoria Solidale del Circeo was born as a consequence of the holder's sensitivity about social inclusion of disables. Even if, as we said, he adopts an entrepreneurial approach, his main concern is to supply an opportunity to improve quality of life of a specific category of people and not to improve his earning.

This attitude is consistent with other actions he puts into practice on the territory. For instance, independently of this specific experience, he has often employed disadvantaged people when he was asked by local association to help someone.

Since the main drive behind Fattoria Solidale is a social concern, we conclude that in this case the CSR model seems to prevail, but together with CSR feature we can underline that it is also a case of innovation as well as an example of Multifunctionality of agriculture.

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EDUCATION OF AGRICULTURAL PRODUCERS INTENDED TO IMPROVE FARM OPERATIONS AND MANAGEMENT[1]

Jonel Subic[2], Zorica Vasiljevic[3], Sanjin Ivanovic[4]

Abstract

Having in mind that rural areas occupy the greatest part of Serbian territory, where agricultural production represents the basic source of income, development of this sector is of great importance not only for local community, but also for entire Serbian rural area. At the end of previous decade in developed European countries it was promoted a model of rural development which assumes multifunctional nature of European agriculture, as well as its development role in economy and entire society. In the first decade of this millennium Serbia has made decision to develop the same concept.

By possession of adequate training for utilization of scientific and research methods in identification of local community advantages and disadvantages, as well as for priorities' determination and strategic plans' creation, representatives of local communities will be able to contribute to better and faster development, as well as to a higher quality life in their own rural areas.

Education program designed for agricultural producers *aims to* improve knowledge of registered farm holders (and their family members) in field of business and management. *Specific objectives* of the training are to increase sales of goods and services in domestic and foreign market, to increase competitiveness in a particular market, to achieve higher profits, to create new jobs and improve living conditions in rural areas.

In this paper there are shown the results of the mini-projects that have been implemented by The Institute of Agricultural Economics - Belgrade in the 2006-2008 period. Those were special educational projects in agriculture and rural development, whereas extension activities were concentrated onto three topics: farm management, support of rural development and improvement of small farms. Implementation of the first and the third project took place on the territory of the South Banat County, while implementation of the second project was conducted on the territory of the Belgrade city communes.

By detailed analysis of needs to solve current problems of sustainable agriculture and rural development, there were identified *priorities* related to investments, strategic planning and tourism.

Given the complexity of the programs implementation, educational activities were aimed at a number of holders or members of their registered farms. The dynamics of implementation of projects included introduction and discussion with a number of farmers, and afterwards

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formation of small group of educational programs users, preparation and making of materials in written and electronic form, a series of theoretical lectures and in the end determination of the result of joint work.

Evaluation of projects was related to the determination of the level to which were achieved set objectives, defining the implementation of projects in accordance with the plan, as well as the impact of educational activities to promotion of knowledge concerning business and management. Evaluation of projects is done from 1 to 5, as the highest grade.

Key words: education, investments, rural development, tourism, local community

Introduction

Increase of investments in agriculture presents precondition for its technical and technological modernization. Finally, it is one of preconditions for stability of entire national economy. Without adequate volume and structure of investments (on local, regional or national level), it is not possible to provide increment of fixed and working assets, growth of employment, increase of labor and machinery productivity, production diversification etc.

In circumstances where agricultural activity is based on private owner structure, as well as opened and competitive market, investments should be realized in form which ensures maximal effectiveness of exploitation (as higher as possible achieved level of effects per unit of invested financial resources). Financial decisions making in agricultural practice (in all economic circumstances) should be based on strict quantitative and qualitative clauses. They will provide precise orientation of expenditures, i.e. investing in the most effective projects' variant. No matter who is an investor, he has to use adequate methods, techniques and models to evaluate economic effectiveness of investments in agriculture. In such a way the investor ensures that his financial resources are invested in appropriated way, and that they provide the best results not only for him but also for entire society.[5]

Rural areas in Serbia are involved in transitional process that has been under way for several years. Changes in domestic agrarian policy in sense of orientation towards rural development and multifunctional agriculture resulted in involvement of state institutions, local authorities and inhabitants of rural areas in development process. Such approach to rural development is the best way to facilitate integration in international institutions, European Union, and to strengthen over – border cooperation in this field, as well.[6]

Rural development, as a rule, does not have concrete bearer (for example an enterprise). Complexity of rural development is connected to interests of many enterprises and other subjects; to interests of local population and other inhabitants. Keeping that fact in mind, state should incentive and support rural development. State is the only one that could use its territorial agencies and departments to start, realize and manage development of concrete territories.

5 Cicea, C., Subić, J., Cvijanović, D. (2008): *Beyond Agriculture and Rural Development: Investments, Efficiency, Econometrics*. Institute of Agricultural Economics, Belgrade.

6 Vasiljević, Z., Subić, J. (2008): *Značaj bottom-up pristupa u planiranju i realizaciji lokalnih in regionalnih programa ruralnog i poljoprivrednog razvoja u Srbiji*. Predavanje po pozivu. Tematski zbornik Savetovanja *Agrarna i ruralna politika Srbije 2, Početna iskustva pridruživanja EU i predlog mera za 2009. godinu* (Agricultural and Rural Policy of Serbia 2, Initial Ehperiences of EU Accession and Proposal of Measures for 2009), Iriški venac, 9. oktobar 2008. DAES - Društvo agrarnih ekonomista Srbije, Beograd; str. 57-66.

To begin realization of rural development in certain territory it is necessary to finish a lot of work in preliminary stage. Such work includes professional and experts' engagement which is needed to establish development strategy. The strategy would represent foundation for undertaking of complex development activities.

The most important element that is necessary to create development strategy is participation of all local community representatives in identification of existing possibilities and priorities which are important for local community.

Having in mind tendencies on tourist market (abandonment of mass tourism concept) recently is noticed increase of interest in so called "tourism of special needs". This is in accordance with fact that (on the end of last decade, as an act of political will) was promoted model of rural development (CAP). The model presents multifunctional nature of European agriculture and its development role in economy and entire society. Agriculture, as primary economy branch, has long term consequences for complementary cooperation with all economy sectors, so does with tourism.[7]

Various tourist modes (such as rural tourism, hunting tourism, fishing tourism, sightseeing tourism, manifestation tourism) are some of activities which are accessible to rural areas inhabitants. However, tourism development does not have to be accidental or result of local inhabitants' gumption. It has to be subject of serious analysis and planning on all levels (local level, municipality level), in tourist organizations as well as in various enterprises which may have economic interest in tourism development. This is why it is necessary to use systemic approach in such activities. Education is a start point which is necessary and needed to build future development.

Material and method

Education program for the holders of registered farms and their family members was initiated in order to raise their business skills. The primary objective of the program is to raise the competitiveness of farms (in order to improve their business and market efficiency), and promote the provision of business services. The secondary objective of the program is to develop tourism in rural areas as well as to include many farms in tourism.

Bearing in mind complexity and requirements connected to implementation of accepted program, within mini-projects that have been implemented by The Institute of Agricultural Economics-Belgrade in the 2006-2008 periods, educational activity was directed only towards certain number of competent bearers (or family members of their registered farms). Hence, depending on size of settlement, educational program included no more than 20 attendants. Therefore, dynamics of project realization occurred in following way:

First of all had been performed introduction and conversation with number of agricultural producers, and after that were formed small groups made up of chosen members;
Followed preparation and making of working material in printed and electronic form;
After that were performed series of theoretic lectures, as well as unavoidable workshops;
During lectures was applied certain way of testing, in order to strengthen attendants' knowledge;

7 Vuković, P., Subić, J., Cicea, C. (2007): *Marketing Performing a Function in Tourist Development of Novi Sad*. Petroleum - Gas University of Ploiesti, BULLETIN, Economic Sciences Series, Vol. LIX, N_O. 1/2007, pp. 1-6.

On the end were summarized results of joint work, clarified all obscurities and participants agreed on future cooperation in project realization.

Activities concerning project named "*Planning and appraisal of economic efficiency of investments on family farms"*, had following dynamics of realization:

Preparing activities (detour of the area; conversation to agricultural producers; choosing and forming of working groups; production, printing and multiplication of brochures as well as materials in electronic form);
Educational activities of theoretical character (with topics: idea of investments; structure and classification of investments; characteristic of investments in agriculture);
Educational activities of theoretical and practical character (with topics: planning of investments; basics of investment calculation; sources for financing of investments; idea of capital costs);
Educational activities of theoretical and practical character (with topics: concept of economical efficiency; criteria for evaluation and analysis of economic efficiency of investments on micro economic level; time value of money and its importance for determination of economic efficiency of investments in agriculture etc.).

Activities regarding project named "*Participation work on identification of possibilities and priorities in rural development of local community"* had following dynamics of realization:

Preparing activities (detour of the area; conversation to agricultural producers; choosing and forming of working groups; production, printing and multiplication of brochures as well as materials in electronic form);
Educational activities of theoretical character (with topics: idea of rural development; idea of strategic planning; description of importance of strategic planning - theories and concepts; important factors/participants in rural development; usage of appropriate tools to define and analyze existing situation; SWOT analysis; methods for determination of priorities);
Educational activities of theoretical and practical character (with topics: formation of data base, formation of development strategy; methods for preparations of strategic plans; implementation, supervision and promotion of strategic plans in rural development).

Activities related to project named "*Tourism as a chance for development of rural areas"* had following dynamics of realization:

- Preparing activities (detour of the area; conversation to agricultural producers; choosing and forming of working groups; production, printing and multiplication of brochures as well as materials in electronic form);
- Educational activities of theoretical character (with topics: idea of tourism; characteristic of tourism as economical activity; complementarities of tourism and agriculture);
- Educational activities of theoretical and practical character (with topics: social and economical importance of tourism; organization of tourism in rural areas; marketing concept and its application in tourism; conditions and possibilities for development of tourism in rural areas; sustainable tourism development of rural areas; types of tourism; tourism of specific interests – chance for rural areas economic development).

Realization of *the first project* have taken place on the territory of Province of Vojvodina, in South Banat County (on the area of four agricultural municipalities: Pančevo, Kovačica, Opovo and Alibunar), realization of *the second project* have taken place on the territory of Central Serbia, in municipalities of the city of Belgrade (on the area of six agricultural municipalities:

Palilula, Zemun, Surčin, Grocka, Obrenovac and Čukarica), while realization of *the third project* have taken place on the territory of Province of Vojvodina, in South Banat County (on the area of three agricultural municipalities: Pančevo, Kovačica and Alibunar).

Two-phase procedure was used to evaluate the project, where the first was done evaluation of individual project activities (preparatory and educational), and then was determined collective grade of the project (from 1 to 5). Accordingly, there were established following criteria: level of achievement of set objectives, level of project implementation in accordance with the plan and level of advancement of knowledge in the field of business and management.

Results and discussion

On the basis of adopted theoretical knowledge and practical work (through workshops) regarding certain computational operations which are necessary for *planning and economic evaluation of investments at family farms*, direct producers have obtained certain skills:

to understand influence of usage of certain investment evaluation techniques and methods to investment decisions;
to evaluate effectiveness of investment which is planed;
to carry out cash flow analysis and to analyze investment projects' financing conditions;
to avoid consequences of inefficient investing;
to minimize risk that is associated with realization of business idea etc.

On the other hand, it is indicated an importance of economic efficiency of investments in agriculture. It is also determined necessity of education of agricultural producers (primarily bearers of developmentally orientated farms). They have to think out, prepare and realize business idea, which means to carry out planned investment activity that will enable their economic growth, financial stability and social safety.

Education within the *first educational project* was carried out in following intervals[8]:

from May, 15th 2006 to June, 15th 2006;
from June, 20th 2006 to July, 20th 2006;
from August, 14th 2006 to September, 14th 2006;
from October, 23rd 2006 to November, 23rd 2006.

In all cases there were engaged three lecturers, regardless character of educational activity (theoretical or practical).

Based on the established evaluation criteria, following evaluation of project activities has been carried out: preparatory activities (grade 5), educational activities with theoretical character (grade 5), and educational activities with theoretical and practical character (grade 5). In this context, collective grade of the project has been determined (5).

On the basis of earned theoretical foundation and practical work in overwhelming of certain analytical knowledge which is necessary for *planning and evaluation of undertaken actions for development of concrete rural area*, representatives of local authorities have acquired following possibilities:

to see how application of some methods influence decision making;

8 Time intervals were determined depending on engagement of project participants in everyday work on their farms (i.e. depending on intensity of works in agriculture).

to use certain models for priority determination;
to take part in determination of development plans for their region;
to monitor future development and improvement of development processes in appropriate way etc.

Besides, there was indicated importance that has local community representatives in identification of possibilities and priorities which are of the greatest importance for establishment of adequate data base. Data base which is formed in such a way should be used as basic for establishment of adequate strategy of concrete region development. Such regional strategy should be in accordance with national development strategy as much as possible. Cooperation between local community (on one side) and scientific and research institutions (on the other side) in recognition of crucial indicators of regional development is of great importance.

Education within the *second educational project* was carried out in following periods:

from October, 1st 2007 to October, 31st 2007;
from November, 1st 2007 to April, 30th 2008;
from August, 1st 2008 to September, 30th 2008.

There were always engaged three lecturers, no matter of character of educational activity (theoretical or practical work).

Based on established evaluation criteria, evaluation of conducted project activities was the following: preparatory activities (grade 5), educational activities with theoretical character (grade 4), and educational activities with theoretical and practical character (grade 4). Accordingly, collective grade of the project has been determined (4).

On the basis of theoretical lectures and practical work (regarding knowledge on tourism) agricultural producers which participated in education project have got basic knowledge needed for planning, organization, coordination and leading of all activities on the level of households and villages, as well as mini tourist agencies. In accordance with above mentioned, appear following possibilities:

to grasp influence of tourism and its implementation to social and economic development of rural areas;
to evaluate effectiveness and efficiency of tourism in realization of established goals and various interests;
to grasp chances for development of own local community on the basis of available resources;
to avoid consequences of omission of natural and social development potentials;
to decrease risk of income realization etc.

Additionally, there was indicated importance of tourism for development of local communities and need for agricultural producers' education (primarily education of developmentally oriented farm bearers) regarding rural tourism activities. In rural areas tourism might present additional source of income for agricultural producers. Afterwards, in following development phases, for some households (which have mixed income sources) tourism could become bearer of development. There are expectations that tourism will enable economic growth, financial and social safety.

Education within the *third educational project* was carried out in following intervals:

from October, 1st to October, 31st 2007;
from November, 1st 2007 to May, 1st 2008;

from August, 1st 2008 to September, 30th 2008.

Every time there were engaged four lecturers, and their engagement did not depend on type of educational activity (theoretical or practical character of work).

Project activities were evaluated on the basis of established evaluation criteria, in following way: preparatory activities (grade 5), educational activities with theoretical character (grade 4), and educational activities with theoretical and practical character (grade 4). In this context, collective grade of the project has been determined (4).

Conclusion

Proposed "Program of direct education of agricultural producers and bearers of rural development" started from basic assumptions and goals of strategic planning process. The program is founded on detail comprehension of local resources (material and non material) as well as local needs and potentials. There were deliberated basic theoretical elements, and complexity of economic, social, ecological and institutional components. This is start point for evaluation of existing social capital, promotion of desirable and elimination (or reduction) of undesirable processes and tendencies. The goal is to establish partnership between local participants. They have to determine, coordinate, optimize and carry out activities which provide long term increase of total life quality on local level.

Key elements that are necessary to create appropriate development strategy are participation of chosen local community representatives in identification of existing development possibilities, and determination of priorities which are important for local community.

Direct educational program enables local community representatives to qualify, and to improve their life quality in rural areas. Rural development of certain region significantly stimulates rural development in other regions (i.e. initiates rural development on national level) as well as in entire society. Implementation of special educational program in agriculture has following basic reasons:

- creation of vision concerning future goals of entire society;
- creation of overall picture regarding future changes in economy, environment and people;
- assurance of benefits for all society members;
- selection and consensus on basic common goals;
- involvement of number of local citizens and organizations in process of development planning and implementation;
- determination of resources which are needed for realization of changes;
- provision of support from state, private sector and non profit partners.

Territory, as a system, is under permanent evolution. The evolution is caused by endogen factors, development process, changeable and hardly predicted environmental factors. Thus, it is necessary to predict certain intervention during future socio – economic development of local rural communities. These interventions should be done to reroute programs, projects and other activities which are predicted in plans. Education of agricultural producers and bearers of rural development in order to enable them to identify development possibilities and priorities on local level is continual process.

Comparative analysis of evaluation of project activities, as well as the projects themselves as a whole, leads to the final conclusion that the education program on investments, entitled ""*Planning and appraisal of economic efficiency of investments on family farms"* has the most successful realization, and thus the highest collective grade (5).

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BRANDING REGIONAL IDENTITY AS A DRIVER FOR RURAL DEVELOPMENT

Lies Messely, Joost Dessein, Ludwig Lauwers[1]

Abstract

Within the globalizing world, regions and their identities are subjected to great pressure. At present, places are engaged in a process of "territorial competition" in an integrated world economy. The identity of the region can be used as a starting point to brand a region and differentiate it from others. In the regional branding process, the region as a whole becomes a product or brand and offers a "basket" of regional products and services. This paper discusses the possibility of regional identity as a mobilizing force for rural development, by studying best practice examples of regional branding. Using the grounded theory approach, we conducted interviews in three case regions: West Cork (Ireland), Groene Woud (the Netherlands) and Pajottenland (Belgium). The study of these cases led to the formulation of critical success factors on the organization of regional branding.

Key words: identity, region formation, regional branding, rural development

Introduction

Globalization processes expose most parts of the world to similar influences (Simon, 2004). As a consequence, people and companies are less bound to a particular region. The "pull to sameness", leading to convergence (Taylor 1999: 162), loosens traditional cultural boundaries and lifestyles and results in "uniformization". Regional identity becomes threatened. People may start to feel insecure as their traditional cultural underpinning weakens.

This cultural insecurity leads people to look for recognizable points of reference in their own surroundings. Differences between regions are emphasized, and region-specific features, such as scenery, regional products or cultural-historic heritage, are assigned more value and used to fix identity. These "forces making for difference" (Taylor 1999: 162), which lead to divergence, return the processes of globalization to place-specific forms. In this way, globalization and localization are not opposite, but rather part of the same development: globalization. (Simon, 2004). Globalization results in a shift of focus to the regions, and a regional approach to politics, science and society (Wiskerke, 2007).

Rural areas share these trends of globalization and localization, particularly in the agricultural sector. Globalization, coupled with modernization, has created specialized, integrated and larger-scale agricultural enterprises. Modernization processes in the agricultural sector have consequences on the economy (e.g., oversupply, cutback of internal market instruments), ecology (e.g., nitrate surpluses and pesticide residues) and the social sphere (e.g., isolation, bad image). These side-effects of modernization put pressure on modern agriculture (Van Huylenbroeck, 2006). Modernization has also resulted in rural restructuring: there is a transformation from an economy centered on agriculture and manufacturing to a more service-centered economy, and

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likewise from production to consumption (Floysand and Jakobsen, 2007).

Localization is the rural inhabitants' response to modern agriculture and the changing needs and expectations of society. Place of origin is becoming more prominent, as seen from labels like Protected Denomination of Origin (PDO) and Protected Geographical Indication (PGI) (de Roest and Menghi, 2000). More and more regional products and rural tourism arrangements are entering the market. In newly emerging approaches to rural development, the region is seen as the level of integration and identity takes a central theme (Leader+, 2008).

Identity is part of the institutionalization of regions, the process through which regions come into being (Paasi, 2002). The concept of identity is ambiguous and dynamic. Kruit et al (2004), and Ernste (2005) indicate that identity is a multi-complex concept that is difficult to grasp. It also relates to an abundance of topics. Spatial identity must relate to the individual's personal identity, and it is a social construct as well. People attribute "meaning" to the observed characteristics of a place, making the environment more than just a random collection of physical and material elements. They identify themselves with a certain area, not only with the landscape, but with a whole set that encompass culture, sociality, morality, tradition and the social system specific to that region (Raagmaa, 2001). Identity is not the same as the history or biography of a region, nor is it tradition or folklore (Ernste, 2005). It is a dynamic concept, subject to ongoing social processes.

Paasi (2002, 2003) differentiates between the "identity of a region" and "regional identity". The identity of a region refers to those distinguishing physical, cultural and historical features that make one region different from another. Regional identity (or regional consciousness) refers to the extent to which people identify themselves with the region as the whole of institutionalized practices, discourses and symbols. While these exist simultaneously as part of the process of social reproduction, this distinction helps us to understand and analyze both the structure and power elements hidden in discourses on regional identity and individual regional consciousness (Paasi, 2002).

As mentioned above, identity is closely interrelated with region formation, and the rise of regional identity must be seen in the broader context of region formation (Simon, 2004). There are two major perspectives regarding the formation of regions: a structurally oriented perspective and an agency-oriented perspective. In structurally oriented perspectives, the rise of the region is considered to be a logical outcome of broader trends and pervasive developments, such as globalization, flexibility of production, state restructuring, and urban expansion (Lagendijk, 2007). In agency-oriented or social-constructivist perspectives, regions are seen as social constructs, defining and shaping themselves as part of, and through, different social and discursive practices (Lagendijk, 2006). Paasi (2002), one of the founders of the constructivist approach, describes region formation as a process of institutionalization. Here, institutionalization is the outcome of four simultaneous and interconnected working forces: i) territorial, ii) institutional and iii) symbolic shaping, and iv) internal and external recognition or identification.

Lagendijk (2007) facilitates study of the construction of regional identities by linking both structurally and agency-oriented perspectives together in a framework. This linkage is seen as part of an evolutionary process in which the region first becomes privileged, and then achieves coherence once institutionalized. It begins with a limited set of pervasive economic, political or social driving forces creating some "windows of change" (structurally oriented perspectives). These various

windows are then converted or translated into specific forms of policy-making, as well as practices and performances at both the individual and organizational levels. Finally, these "new" practices and ways of policy-making become regularized and institutionalized in new forms of regional governance (agency-oriented perspectives). Once regions have a recognized position, they receive an established role in the territorial structure, and thus have a regional identity.

Regional branding

Places are currently in "territorial competition" in the context of a world economy that is becoming more and more integrated (Hospers, 2004). Although many places offer the same "product" – territory, infrastructure, educated people, and an almost identical system of governance – they must compete with each other for investment, tourism, residents and political power, often on a global scale. To stand out from the crowd and capture significant mind- and market share, place branding has become essential (van Ham, 2008). Place branding or place marketing is a promotional strategy that includes all activities that increase the attractiveness of an area as a place for working, living and spending free time (van Ham, 2001). Place branding can be applied in cities or countries, and it can also be adapted to regions. Regional branding is aimed at creating a more distinctive image or reputation, which helps to increase regional competitiveness (Maessen et al., 2008). Regional branding markets the qualities of the region in the broadest sense: landscape, nature, cultural heritage, regional products, regional gastronomy, traditional quality products, and so forth (de Bruin, 2008). In regional branding initiatives, the identity of the region and the regional identity, as defined by Paasi (2002, 2003) serve as a basis for the regional brand or mark used to promote the region (Sonneveld, 2007). Regional branding stimulates the regional economy, creates added value for the regional products and services, and can break through existing restrictions of sector-oriented approaches to rural development (Hegger, 2007).

As mentioned above, the countryside has experienced a transformation from production and consumption and has become a commodity that can be bought and sold (Floysand and Jakobsen, 2007, Kneafsey et al., 2001). Regional branding rides this trend of "commodification". Regional branding goes beyond commodification and can be equated with mode IV of the culture economy, a concept developed by Ray (1998) and adopted by Kneafsey et al. (2001). In the cultural economy approach, cultural identity is used to attempt to localize economic control in order to (re)valorize place. Culture economy includes those strategies to transform the local knowledge into resources available for the local territory, i.e., the recognition (or construction) and valorization of local knowledge (Ray, 1998). The culture economy model has four modes. Mode I can be compared with the commoditization put forward by Floysand and Jakobsen (2007) and Kneafsey et al. (2001), among others. Mode II activities emphasize the incorporation of cultural resources into a territorial identity in order to promote the territory to the "outside" (Kneafsey, 2000). In Mode III, the territorial initiative sells itself internally, to the communities, businesses, groups and official bodies of the local area. Mode IV, which emphasizes the normative capacity of the culture economy, can operate within each of the other three modes. Mode IV suggests that a local economy, during re-examination of the territory's indigenous culture, may choose to pursue "alternative" development paths (Ray, 1998). The local culture then becomes more than an instrument to fuel trade in the global economy, and instead is rediscovered as the source of local wisdom and ethics.

Lee et al. (2005) state that the internal marketing of the region to itself, as a part of regional branding, is a way of creating social capital. Social capital – with respect to rural development

processes – could be defined as the capacity to get things done collectively. It is embodied in the ability of individuals, groups, organizations and institutions to engage in networks, to cooperate, employ and use social relations for common purpose and benefit (Tisenkopf et al., 2008). When a region markets itself internally, a stronger sense of shared identity emerges, which fosters trust and cooperation that can be mobilized for developmental benefits (Ray, 1998).

Material & methods

The aim of the current research is to discover the factors that create success and failure in regional branding processes, to understand how these processes take place, and to map the complexity of the matter. Because the research question stated above expects qualitative answers based on subjective data, case analysis has been based on the grounded theory approach. Grounded theory involves a consequential induction from empirically collected data in order to build theoretical frameworks. These empirical data, in the form of transcripts of semi-structured interviews, are analyzed through the process of coding (Strauss and Corbin, 1998). The central concepts that form the basis for a theoretical framework are derived from relating and abstracting the data categories (Devillé, 2008). The collection and analysis happens simultaneously, and the theory developed should explain most parts of the process studied. One important aspect is constant comparison, which implies comparing data from different respondents, comparing data with the category and comparing a category with other categories (Charmaz, 2000). Analytic interpretations of data, developed throughout the research process, are used to inform and refine the developing theoretical analysis.

Empirical data collection in this research is done through the method of purposeful or theoretical sampling, which involves searching for information-rich data (Baxter and Eyles, 1997). The cases are selected based on their suitability for illuminating and extending relationships and logic among constructs (Eisenhardt and Graebner, 2007). Sample size is determined by the need to involve as many experiences as possible for the development of the conceptual framework, and saturation occurs when no new themes emerge. This research includes all stages of the regional branding process, from the very beginning to the mature stage. The criteria were formulated, and the cases selected, to cover different stages of this process and to ensure informative results (Table 1).

Table 1 - Criteria for case selection

	West Cork	Groene Woud	Pajottenland
Way identity is perceived and used	++	+/-	+
Development of the region	+	+/-	-
Stage of the branding process	Mature	Intermediate	Very beginning

Research began by contacting and interviewing key informants of the region. These key informants then referred to other possible interviewees (snowball sampling), which could be farmers, entrepreneurs, local guides, mayors, chairmen of local societies, teachers, and the like. Topics of the interviews were the region, the region's agriculture, regional development and regional branding processes. The international cases, namely West Cork and Groene Woud, served as exploratory case studies. These regions were examined on-site during one week each. Factors of success and failure of these cases are then verified in the Belgian case study, Pajottenland. This region, which started only recently with a regional branding process, can be observed in detail due to its close proximity.

Results

West Cork is the southern region of Ireland, with Cork as its capital. It is a rural area of 320,000 hectares of mainly grassland, has mountainous scenery, and is surrounded by the sea. Other distinguishable characteristics are small villages with colored houses and fuchsia hedges that border narrow meandering roads. Many people from outside the region have chosen to live and work in West Cork in order to improve their quality of life. These "outsiders" pointed out some unique regional advantages to the original inhabitants. The passion and pride of the inhabitants for the region and its food products emerged out of conversations with various inhabitants. The peripheral location of West Cork impedes access to external markets, but on the other hand, it contributes to a more pronounced regional identity and collaboration among the inhabitants. Many respondents stressed the importance of the connection with the soil and the awareness of the food they are consuming. In this regard, small-scale family farms that provide genuine food make a substantial contribution to the territorial identity.

Like the rest of Ireland, West Cork has been receiving European support for rural development since 1992. The West Cork Leader Co-operative Society started in 1995 to use the unique image and identity of the West Cork region as the key driver of the rural development strategy of the region. The basis of the regional branding strategy, the Fuchsia brand, is seen to assist broader development, rather than as a mere marketing strategy. Through images (calendars, posters, brochures, and the like) the Leader Co-operative raises the inhabitants' awareness of the exclusive qualities of the region. The Leader co-operative, a project agency with seven young and dynamic staff members with a private-sector ethos, now co-ordinates the development process as well as the branding process. Their European and national funds are spent on wages of the staff of the Leader Co-operative, communication of the brand and the branding concept, and capital investment in individual entrepreneurial projects. These entrepreneurs can be farmers, artists, hotelkeepers, restaurant owners, retailers, and so forth.

Het Groene Woud is a rural area of 35,000 hectares located between three Dutch cities: Hertogenbosch, Tilburg and Eindhoven. The very flat landscape is characterized by small agricultural parcels framed by lines of poplars and a few nature reserves. The core of the region consists of 7,500 hectares of forests, swamps, heath, and agrarian landscapes. Typical to the area are picturesque villages with small chapels. Het Groene Woud was only named in 2005, when the area was recognized as a "National Landscape". A National Landscape is an area in the Netherlands that has a unique combination of agricultural area, nature and cultural heritage. A couple of entrepreneurs started the branding process of Het Groene Woud as a reaction against the increasing influence of the green movement, which was found to be threatening. One of the interviewees mentioned that "the P of profit deserves as much attention as Planet and People". In 2005, a group of these entrepreneurs traveled to West Cork in Ireland to learn from a region more experienced in region branding.

The interviews with the inhabitants of Het Groene Woud did not give evidence of much intrinsic passion for the region, nor of regional pride. This probably has to do with the recent, rather artificial demarcation and recognition of the region as "National Landscape Het Groene Woud". The entrepreneurs want to make money by branding the identity of the region, because they expect customers to pay more for products with a regional brand. The development process of Het Groene Woud is led by a number of enthusiastic entrepreneurs (mostly farmers) that wanted to cooperate. The entrepreneurs used the available Leader funds

to hire a project agency that drew up and implemented a business plan for their projects. All projects include several regional partners, as Leader funds are not used to support individual project partners: financially supported projects must be able to continue without this support. To resolve the lack of coordination between the different projects, the same project agency was asked to draw up a business plan for the region as a whole, based on the view of the different stakeholders.

Pajottenland is a rural region located in the southwest of the Belgian province of Vlaams-Brabant, only 10-30 km from the center of Brussels. The northern municipalities are more urbanized, while the southern municipalities are rural towns. The proximity of Brussels, the capital of both Belgium and Europe, has unique consequences for Pajottenland as a rural area. The majority of people living in the region work in Brussels, which results in reduced economic activity in the region itself. Pajottenland is characterized by a sloping, closed rural landscape, peaceful living despite the proximity to Brussels, the presence of many "outsiders" and many French-speakers in a Dutch-speaking region, a strongly represented agricultural sector, many castles (including Gaasbeek castle), the Brabant cart horse, and others. Almost everyone in the region still feels somehow related to agriculture.

Since 2002, Pajottenland has been recognized as a Leader+ area and receives European support for rural development. Only the southern, rural municipalities comply with the conditions put forward by the European Union. The development strategy for 2007-2013 takes three tracks: boosting the rural economy, strengthening the infrastructure and rural accommodation, and preserving the rural character. The Local Action Group (LAG) is made up of 24 regional associations (social, economic, cultural and ecological), the town councils, and the social services departments. The acknowledgement of the region as a Leader+ area has led to more cooperation, as funds are only awarded to partnerships and investment costs are only partly refunded. Since the start of a number of coordinating projects, people have started to think more outside the box of their organization. One particular mayor is seen as a very important person in this whole process and is supporting and stimulating several different cooperative initiatives. The majority of the associations and municipalities see this closer collaboration as a very positive outcome of the Leader+ projects. There are many good individual initiatives in Pajottenland, and more cooperation is sure to follow, but co-ordination is still lacking.

Compared with other Leader areas in Flanders, there is rather little emphasis on support for the agricultural sector. Although agriculture is inextricably bound up with the region, Pajottenland's development process aims much more at creating of community. People try to work bottom-up as much as possible, which is not always easy. Compared with other Flemish Leader areas, Pajottenland's provincial administration has limited influence and is not imposing too much. Even so, some decisions made by the Province are not always accepted in Pajottenland, and people feel they get top-down instructions to which they don't feel related.

A new project to brand the region was begun in November 2008. This project is also financed by the European Fund for Regional Development and is done in cooperation with two other Flemish regions. Under coordination of Leader+, a steering committee was created to outline the future direction of the regional branding project. An external marketing bureau was contacted to help determine some unique regional characteristics and to outline the branding strategy. This regional branding project also includes efforts to raise the awareness of the inhabitants and build community.

Discussion

The analysis of the interviews of these cases led to the formulation of some critical success factors. First of all, there is no such thing as a standard manual for regional branding. Every region has its own physical, social, cultural and historical features, which define the case-specific context. Regional branding is based on this specific context and every region has to find a way of organizing it, in order to meet the region-specific needs.

In West Cork, there is a strong sense of belonging to the region and a strong identity, while in Het Groene Woud, there is little or no attachment with the name of the recently defined National Landscape. The name 'Pajottenland' was first mentioned in 1789 and has been used ever since. Recently, the region receives more attention by the inhabitants as well as by visitors. Inhabitants of the region feel strongly connected to their region. If we use the terms of Paasi (2002), we can say that the regional identity or regional consciousness is most pronounced in West Cork, followed by Pajottenland and Het Groene Woud. As for the identity of the region, all three regions have important physical, cultural and historical features that distinguish it from other regions.

If we look at the intention of the regional branding processes in West Cork, we can state that the main focus there is on rural development. There is a strong focus on community-building and raising awareness on the uniqueness of the region. In Het Groene Woud, the basic motivation for the regional branding project was to earn money. On the other hand, in Het Groene Woud, the initiative was launched by a group of motivated farmers, while in West Cork it was the Leader co-operative that started the regional branding project.

For the management of the budget, there is a clear distinction between West Cork on the one hand and Groene Woud and Pajottenland on the other hand. In West Cork, money is granted to individuals, who need this support to be able to continue their business, which is not economically sustainable. In contrast to this, in Groene Woud and Pajottenland, Leader means are only spent on projects of associations or partnerships and the intention is that afterwards, these initiatives can continue without this support.

This context-specificity does not mean however that we can't find some points of attention that are common to all case studies. Maybe the most important point is that passion is indispensable in the process. People who feel closely connected to the region are willing to take the lead in the rural development processes. A strong and common regional identity is necessary in order to mobilize people to take action to preserve and develop their region.

In the regional branding process, cooperation and networks are very important. Successful results can only be obtained through cooperation among the different actors (entrepreneurs, government, associations and so on). Coordination over all these actors is necessary, however this coordination should not be too bureaucratic. It is also very important to take into account the desires and ideas of residents and local organizations. There's little chance of success if they are not convinced of the benefits of the project or if they don't feel involved.

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HUMAN CAPITAL AND FAMILY FARM IN THE OLIVE GROWING SYSTEM OF THE CALABRIA REGION[1]

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Abstract

This research aims at pointing out those constrains and incentives conditioning family farm choices about investments, technical and managerial knowledge and expertness. The planned target has to be achieved through the attainment of three stages. Family farm involves a lot of people by different kind of employee relations, based mostly on a temporary work, that are often within the limits of the work rules. The organization solutions adopted by family farm produce several effects: among which investments and human capital allotment stand out.

This research analyses family farm characteristics in a local rural system of the Calabria Region, as the result of the various European Community and domestic interventions and the specific physical, social and economic features in the considered territory; the attention is focused on the olive growing family farm. The survey is made through interviews carried out by qualified operators using questionnaires organized on different modules.

Key words: human capital, family farm, agricultural labour

1. Introduction

Issues relating to agricultural activity carried out in family businesses by off workers and by members of the family farm, are now in an ever more pressing in modern society. The adoption of specific organizational solutions by the farm family gives implications of various kinds, such as that relating to investment and human capital endowment. Among the many factors that contribute to the formation and accumulation of human capital is intuitive given special importance to training and updating skills, performed by the various institutions. Indeed, in the recently formulated strategic guidelines at European level, training and education are mentioned as strategic actions in both of the measures aimed at promoting knowledge and improving human potential and actions aimed at the diversification of the rural economy. The study of the labor market in agriculture has, in particular, several emerging issues and interesting for their productive, economic and social reflections, which can be traced back to the central problem of the different ways that you can follow to promote the formation of a balance between demand and supply of labor. A problem is the presence of immigrant workers, emphasizing the need for flexible forms of work.

On the other hand, the market of agricultural work, while retaining many of its specific field, expressed earlier than other sectors certain characters of precariousness and flexibility of the workforce, and in recent decades it gradually crushed in a variety of segmented markets, characterized by different conditions of use and stability (joint work, skilled, seasonal, etc.) and employment schemes also

1 The present paper is the result of the common thoughts and co-operation of the three authors. Nevertheless Prof. Agata Nicolosi, in addition to treating the setting and coordination of the investigation, wrote paragraphs 1, 2, 5, 6, while paragraph 3 and 4.1 are the work of Ph.D. Domenico Cambareri; paragraphs 4.2 have been written by Doc. Marco Strazzulla, who has also taken care of the data processing and of the figures of the paragraph 5. Conclusions have been compiled jointly.

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very complex that, especially in southern Italy, are focused mainly on a mixture of figures involved in the agricultural sector to different ways (as employees, owners of small farmers and tenants, etc.). And this is especially in relation to the presence of agricultural holdings and part-time workers that, during the year, place themselves on the demand side (looking for workers during the period of the peak of their company) or on the supply side (they offer their work at other) (Nicolosi 1998, Carrà 1993). In this context, family farms have unique characteristics and management models based on the superimposition of multiple of economic and non-economic objectives and functional to the organization of the family.

These trends show the need to allow for investigations of the labor market in agriculture in order to pick the changes under way and provide appropriate interventions to support.

This study represents a first contribution to the research currently in progress on models for the administration of olive farms in the province of Reggio Calabria[3], and after having explained the methodology and the main characteristics of the area of investigation, this area is examined on the basis of the ISTAT data on the Local Labor Systems (SLL) and of INPS data of the province of Reggio Calabria. Finally, a survey was carried out directly in the ground on a reasonable piece of firms olive family.

2. Survey methodology

The research was conducted using primarily ISTAT database about the Local Labor Systems (SLL) as observation unit of the investigated phenomena. This database has been integrated with the INPS database (with reference to the province of Reggio Calabria) which records the employees from the complaints lodged by employers and the findings made by the same Institute. It should be noted that the INPS data understate the agricultural work, as they concern only of regular employment and therefore do not include undocumented workers and the phenomenon of pay. Moreover the welfare system, designed to protect workers who gravitate in agriculture as a "weak area" of the labor force for the particular conditions of employment that the sector offers (discontinuity, seasonality, lack of qualification, etc.), allows access to the system of guarantees for a large portion of rural population, ensuring a system of protection and a horizontal extension to those who are qualified and providing a bridge to a social redistribution of income not only for the agricultural sector (people who are activated only occasionally in order to access social security benefits), but also for those forms of precarious employment in the unsecured non-agricultural sectors (Carrà 1993, Nicolosi 1998).

This preliminary phase was followed by a more detailed investigation directly in the ground which allowed the preparation of a sampling plan for the subsequent detection of a reasonable sample of family owned olive farms.

The theory that was adopted in the research is that the family owned olive farms, carrying out the work required by the company, are by many factors such as farm size, the existence of specific job alternatives and family engagement in farms and extra farms activities; the level of integration of the farm household which are multi active in the territory; existing legislation relating to welfare and social assistance; the capital structure of the household and

3 The work is part of a broader research project, entitled *Management models and analysis tools of human capital in farm* households (PRIN 2007 - Unit of Sassari, Organizer: Pietro Pulina), part of the national project "*Identification and validation of evaluation tools of human capital in agriculture*" (National Coordinator: Dario Casati).

the availability of resources, including financial, to be devoted to skills training in the family, etc. These influences combine with the specific conditions of the farm household, and in particular with the phase of the life cycle of the family.

To answer these questions a survey was conducted using a panel of data collected among the holders of olive family businesses in the province of Reggio Calabria.

3. Structural characteristics of Calabrese olive

In Calabria olives agriculture is the most representative both in terms of economic, intercepting 30% of the gross marketable production, and structural importance (with about 170 thousand hectares and over 20 million plants), and also for the consequent impact on the environment and landscape. Its significance is also considerable in relation to the national context, affecting approximately 16% of the olive trees and more than 20% of Italian production of oil, and international (9% and 7% respectively of the product in the EU and worldwide). Olive production, more often than not, has a marginal role from an economic-productive perspective, but extremely important from the point of view of landscape, for the use of territories otherwise destined to the abandonment.
The companies analyzed by ISTAT in 2000, in Calabria, are 196,354, with an average area of 4.66 Ha. Olive farms are little more than 70% (138,000) with an average area of 1.20 Ha, for a production of 6.5 million quintals of olives and some 1.5 million tons of oil.

The structural arrangement is highly pulverized, the 90.9% of farms have less than 5 Ha of agricultural area utilized for farming, only 8,6% had an area between 10 and 20 has (Table 1). The remaining percentage is larger than 20 Ha. Regional structural weakness of the business is compounded by the wide prevalence of hilly and mountainous areas reaching almost 90% of regional agricultural area.

Table 1 – N. of farms and olive-growing areas (Ha) for classes of surface.

Classes, Ha	Farms	% of farms	Surface Ha	% of surface
until 5	125.381	90,9	88.892,28	53,8
from 5 to 20	11.848	8,6	54.436,44	32,9
over 20	709	0,5	21.968,56	13,3
Total	**137.938**	**100**	**165.297,28**	**100**

Source: Census, ISTAT 2000.

Companies have difficulties to guarantee employment to the availability of family labor, only 16.4% of these could potentially occupy a full-time employee. The conductor makes the whole enterprise work load, usually accompanied by a familiar (wife and / or children). However, the weight taken by non-family workers (23%) is higher than the national average (13.8%), this is attributable to the specificity of the prevailing production systems: olive and citrus leading to a greater concentration of workers in some periods (particularly in the harvesting).

The phenomena of underemployment of the available family members of workers appear to be widespread and substantial, in fact the relationship between companies whose conductor has its own non-farm activities and the total holdings amounted to 29%; considering the small size company report is very low.

The picture worsens when one considers the age and level of education of conductors: slightly more than 18.3% are under 44 years (compared with a national average of 11%), only 10%

have a high school diploma, this would significantly affect the dissemination and adoption of tools to ensure quality of product and process. The olive oil sector, in particular, requires technological innovations aimed at the quality of product. Mechanization is globally acceptable considering the terrain and the limited availability of land suitable for mechanical (for example, the excessive slope).

Over the past two decades (before the start of the period of crisis in the market), a process of structural change and expansion of the industry took place in Calabria, in large part due to favorable market prospects of olive oil and contemporary public action aimed at supporting investment in the olives, mainly attributable to the Olive Regional Plan and to the degree "olive" in the Monofund Operation Program.

The expansion, which led to an increase in regional oil assets of 20% in terms of number of plants and 6% in terms of area (the mismatch between the two increases is explained by the greater density of new plantings), has been accompanied by evolutionary processes that have affected both the introduction of technological innovations on the individual farming operations and in particular the collection, and the research and setup of new "cultural models". These were made from operations for the conversion of traditional plants and especially as new facilities, built in areas previously devoted to other crops.

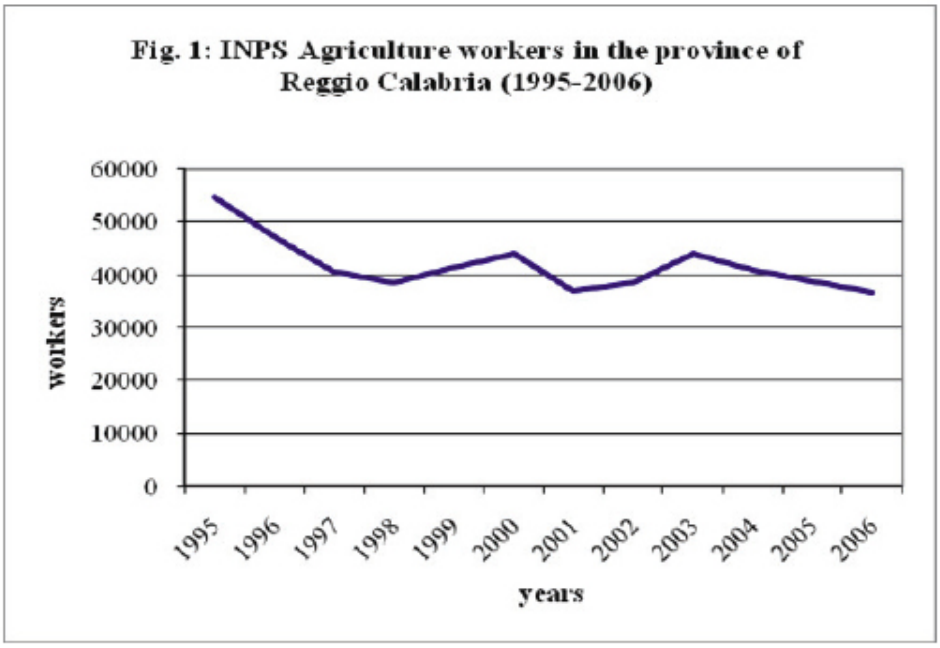
4. Agricultural employment and the Local Labor Systems (SLL) in the province of Reggio Calabria

4.1 Employment in agriculture according to INPS data

The data provided by INPS section of Reggio Calabria allowed analysis of the employment conditions for municipality from 1995 to 2006. This information concerns reports of agricultural employment in the various INPS agencies in the province of Reggio Calabria. The available data have been processed to achieve a formal framework of the employed in agriculture. This analysis allowed to identify the total number of employed in the province, municipality by municipality, and the trend in employment over the decade. The results of the calculations have highlighted the continuing reduction in the number of workers in agriculture. In Italy the phenomenon of the rural abandonment in favor of urban centers has increased since the 70s and the province of Reggio follows a trend in line with national trends although with different speeds. This leads to a continuous process of depopulation and concentration of population to big cities, where there are job opportunities in other fields, particularly in the services sector. This interpretation accounts in part the results obtained, but has limitations related to social issues such as the presence of undeclared rural work, which reduces the differences of the trend in the years 1995 to 2005, but also of part-time work and family helpers who often do not result in complaints INPS.

As shown in Figure 1, according INPS data, employed agricultural show the following trend: the number of agricultural employment began to decline considerably from 1995 until 1998 and have an upward trend in the next two years.

In 2000 the agricultural employment in the province of Reggio Calabria shown to be 44,097 units for 19.1% less than in 1995. In subsequent years the number of work units decreases again to reach 32.8% in 2006 compared to the data registered in 1995.



2.2 Employment in agriculture according to ISTAT data

The structure of employment in agriculture in the province of Reggio Calabria was analyzed through the ISTAT census data (population and agriculture census). Tab.2 shows the relative size of farms according to four age groups: 15-19 years, 20-29 years, 30-54 years and more than 55 years.

Table 2 - Percent of agricultural employment by age group in the provinces of Calabria – 2001 Census

PROVINCES	Age group from age of 15				
	15-19	20-29	30-54	55+	Total
Cosenza	0,9	12,1	67,9	19,2	100,0
Crotone	0,6	11,1	69,2	19,0	100,0
Catanzaro	0,7	11,4	72,3	15,5	100,0
Vibo Valentia	0,9	12,0	72,5	14,7	100,0
Reggio Calabria	1,4	14,4	69,5	14,6	100,0
Calabria	1,0	12,6	69,6	16,8	100,0

Source: Census, ISTAT 2001.

The province of Reggio Calabria has a number of employees in the young age groups (15-29 years), higher than other provinces (15.8%). In the class of intermediate age (30-54 years) is concentrated more jobs (69.5%), while employment traps 14.6% over 55 years.

Over the years the female component has acquired even in Calabria a weight increase. Women have gradually assumed an increasingly significant part of the farm, and according to data from the ISTAT census of the population they are the 33.8% of employed in agriculture in the province of Reggio Calabria and 20,1% of employed women in the complex.

Even ISTAT data collected since the last general census of agriculture allow drawing a certainly interesting picture of the primary sector, because it's possible to focus on the developmental

processes and to make some assumptions about future trends. The census data also give the amount of paid work in agriculture, and they shown, beyond the number of employees, the work days done by various groups that have worked. There are two main categories: the family labor - divided into tenant, spouse, family and other relatives - and the non-family labor, divided into fixed-term labor and labor for an indefinite period, whether managers and workers and similar employees.

The farms of the province of Reggio Calabria are characterized by a predominantly family-run, from a legal point of view and about the commitment to work in the management of production processes. In fact the picture of the labor force is still characterized by clearly dominant role of family labor compared to labor outside the family: in 2000, in fact, over 70% of the total number of days worked on detected farms is provided by family labor and only the remainder is made up of non-family workers.

For the surveyed workers that they had paid agricultural work days on the farms in 43% of cases, these are conductors, 23% married, 30% of cases of other family members of the conductor and finally, 4% of relatives of the same.

More than half of the working days (60%) is held by the same company conductor, while her husband carries 20% of days of work, other family members and relatives of the conductor covering the remaining 19%. Regarding the non-family labor, workers and similar cover about 88% of working days, the remaining 12% are managers and employees. These revealed a number of non-family personnel amounted to 31,690 units, representing approximately 21% of those employed on the farm, 90% are workers and 10% assimilated by managers and employees. Only 1% of those is employed under a contract of indefinite duration. In detail, 97% of the daily work is done by fixed-term employees, this is obviously due to the small size of corporate farms in the province.

Despite the proportion of family labor is very high, there was a decline in days worked by family members and relatives of the conductor from the previous census of agriculture. This confirms that is an ongoing evolutionary process that, first, shows the reduction in the number of those who choose to work within the family farm as a fallback to the absence of alternative employment, while that is linked to deep changes to family structures, increasingly characterized by a low number of children in the past and, consequently, reduced potential for collaboration within the household.

5. The Local Labor Systems (SLL)

Rural areas are facing today in a new form than in the past and they become territorial systems in which economic activities are increasingly integrated with each other and where the role of agriculture assumes different characters depending on the different tasks it has to play: environmental sustainability, provision of services to the community and with the capacity enhancement of human capital (environmental and landscape services, tourist, recreational, educational and cultural), development of human resources and social capital in the area, marketing of quality food products, etc.

In recent years, the literature has paid increasing attention to the role played by the territory as a key to understanding the different paths of development. The territory becomes a "unit of investigation and classification of economic and social facts, since the economic phenomena show obvious interdisciplinary (geographical, socio-economic, market, etc..) able to link business, manufacturing sectors and population, "because it is within the various communities are formed through the integration of production and consumption and the fulfillment of their needs". The territory is thus a social construction of multifunctional character as it is an association of residential settlements of different productive locations and is configured in "local systems" "*with different degrees of socio-economic development*" (Nice 1987).

The recognition of the local system as "socio-economic based territorial units" allows its use as a source of explanation of the structure and change of society and economy. Based on the considerations made so far, we have chosen to adopt the SLL as the unit of inquiry, calculated by ISTAT on the basis of data of the general population census of 2001. The Local Labor Systems (SLL) is defined as a portion of territory consisting of several municipalities adjacent to each other, geographically and statistically comparable, representing the places of everyday life of the population that lives there and works, built since the calculation of matrix commuters who takes into account the daily movement for work purposes.

The list of SLL is available by ISTAT and calculated on the basis of data of the census of 2001. The indicators relating to employment areas are calculated on the basis of aggregation of ISTAT municipal data.

As shown in table 3 in Calabria 12 SLL, 77% of the municipalities involved in the employment areas are systems with no specialization.

Table 3 – The Local Labor Systems (SLL) in the province of Reggio Calabria

Local Labor Systems (SLL) Name	Database 2001 (Census)								
	Group	N. of municipality 2001	Surface 2001 (sq.km.)	Resident population 2001	Class size	N. of families in the SLL	N. of Housing in the SLL	N. employees of local units in the SLL	N. local units in the SLL
Bianco	A01	6	157,4	10.476	2	3.701	6.372	1.127	523
Bova Marina	A01	7	259,8	17.883	2	6.783	11.707	2.233	1.049
Gioia Tauro	Ba04	9	269,4	72.756	3	24.789	34.045	13.823	4.177
Gioiosa Ionica	A01	3	57,6	8.250	1	2.852	4.325	1.176	536
Locri	A01	16	524,9	66.264	3	23.030	33.410	12.088	3.640
Marina di Gioiosa I.	A01	3	134,4	13.440	2	4.852	9.224	1.693	772
Melito di Porto Salvo	A01	6	276,5	24.238	2	8.813	14.249	3.704	1.170
Oppido Mamertina	A01	6	183,2	14.590	2	5.181	7.188	1.783	719
Polistena	A01	8	179,6	43.403	2	15.171	21.230	6.704	2.215
Reggio Calabria	BB03	13	488,9	229.499	4	80.613	108.289	55.567	13.147
Roccella Ionica	A01	5	200,9	19.003	2	7.277	13.622	2.590	1.030
Rosarno	A01	6	181,4	26.313	2	9.126	12.041	2.929	1.140
Sant'Eufemia d'Aspr.	A01	3	69,4	7.020	1	2.424	3.957	819	376
Stilo	A01	5	152,1	9.373	1	3.451	5.917	1.127	529
Total		96	3.135,5	562.508		198.063	285.576	107.363	31.023

Group: A01=Systems without specialization; BB03=Agricultural vocation systems; BA04 = predominantly port urban area. Class size: 1= to 10.000; 2=10.001-50.000; 3=50.001-100.000; 4=100.001-500.000

6. Olive family farms in the province of Reggio Calabria: sample survey, first results

In the territory under investigation it was found 19 olive farms in 4 municipalities, representative of the reality of the olive-growing province. They intercept 161.5 hectares: 67.6% of those are organic farms and 32.4% are conventional farms. The plants are considered a medium-high intensity level for land, operating and technology. The choice was also made according to the quantity and reliability of data collection and the professionalism and availability of the operator interviewed.

The analysis of the uses of work, measured in hours per hectare per year is reported in Table 4. Average employment is around 170 hours per hectare. With reference to individual farming operations, they show similar levels of activity between the two cropping systems. Cultivation operations that absorb the larger use of labor are the harvest, whatever the mode (mechanical, manual), and pruning. Pruning affects less than a year is usually carried out on 30-40% of plants of the company. Pruning affects less than a year as is usually carried out on 30-40% of the plants of the company.

Table 4 - Application of labor per unit of average size (dd/year) and unit (hour/kg of oil) in conventional and organic plants collected in the province of Reggio Calabria in the year 2008-09.

Cultivation operations Total (workdays)	Application of labor per unit of area and type of plant (dd/year)		Application of labor per unit of product (hours/kg of oil) and type of plant	
	Conventional	Organic	Conventional	Organic
Pruning	1,8	1,5	1,53	1,53
Soil Preparation	0,8	0,7	0,65	0,77
Fertilization and irrigation	1,2	0,6	0,97	0,61
Pest	1,0	0,4	0,83	0,46
Harvest	22,8	23,4	18,61	24,20
Total	27,6	26,7	22,60	27,58

The analysis for the uses of work for quantity of product (hours / kg of oil produced) shows, compared to individual farming operations, a minor difference in the levels of activities between organic and conventional method. It is evident that to produce 100 kg of olive oil there is the need for 12 hours for organic and 14 hours for the conventional. Family labor accounts for about 70% of the company's needs.

7. Conclusions

The survey clearly demonstrates the difficulties of the provincial agricultural sector, mainly related to natural and structural handicaps of the area. The determination of the consistency of agricultural work and how this work is used in farms (from quantitative and qualitative perspective) is not easy and collides with a series of peculiar difficulties due to the quality of available information, derived from multiple sources of same data and from the presence of very peculiar and difficult to quantify forms of work, such as the spread of entrepreneurship as part-time, the work of family workers, and the very high incidence of seasonal work. Due to these factors it's necessary a great caution in interpreting the results. In fact, the INPS data comes from complaints which are made by employers for access to social security benefits and welfare and from the findings which are made by the same institute which therefore underestimate the farm work and do not include undocumented workers. On the other hand, the discipline of management and pension administration of agricultural workers is structured to allow broad access for even partial coverage of risks. This easiness of access to social security in agriculture has therefore led to expansion in fictitious labor offer. This offer of additional work is represented by the labor force which in many ways falls outside the agricultural

sector and that is available for occasional use in agriculture and for short periods[4]. The initial results of the survey reveal a significant direct presence in the area of organic farming which shows an indicative data in relation to the net return per unit of family labor that is significantly higher in organic farms than in conventional agriculture, underscoring that this new form of agriculture offers significant improvements to the business income, in addition to being a more environmentally friendly method.

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4 These are workers with poor stability extra-fields jobs and/or unsecured pension terms and placed into categories that are homogeneous in terms of low socio-economic characteristics (age, gender, employment status, amount of perceived income, etc.). In other cases, this labor force is activated very little and only in order to achieve even a minimum social security benefits (women, students, young people looking for an extra-secure employment in business, etc.).

HUMAN CAPITAL AND FARM HOUSEHOLDS: A MAP OF MANAGEMENT MODELS IN ITALY

Lorenzo Idda[1], Roberto Furesi, Pietro Pulina

Abstract

This paper is designed to verify empirically the choices that Italian farm households make when investing in human capital. Census data from the National Institute of Statistics (Istat) were used to describe the main structural and organisational characteristics of the farms. Multivariate statistical tools were used to process the information in the database, so that the different types of Italian farm households could be defined and geographically located. The results allowed us to analyse the competence endowment inside the family farm by determining the existence, the types and the strength of the relationships between the characteristics of family farms and certain variables which described the specific local environment and the human capital available to the family. At the end of the paper we make some suggestions for norms which may be of value to policy makers.

Keywords: human capital, household farms, agricultural labour, spatial analysis.

Introduction

More than 90% of the 2.5 million Italian farm workers are exclusively or mainly family members (Istat, 2003). In such farm households the management models are conditioned by economic and extra-economic objectives and are influenced by various factors. Among these the most important are: i) the existence of employment opportunities other than labour on the farm (Mortensen, 1986); ii) subsidising underemployed labour resources (Barkley, 1990); iii) legislation on social security and welfare for agricultural workers and the rural population as well as access to effective incentives for early retirement (Sundstrom and David, 1988; Gale,1993); iv) the structure and size of the family holding and, to be more precise, the predominant property owning system in the area (Gasson and Errington, 1993); v) the availability of resources for investment in general and the specific knowledge of the availability of such resources in the family (Bernheim et al., 1985; Huffman, 2001). These environmental factors influence the farmers' organisational and strategic choices in different ways.

The adoption of organisational and management solutions by household farms has several implications for human capital investment and endowment. This argument is of great importance today, because the new European Agricultural Model (sustainable, multifunctional, competitive in the global arena) introduced by the recent CAP Reforms requires new skills and knowledge and the family farm has to immediately adapt to it (European Commission, 2003).

This paper is designed to verify empirically the choices that Italian farm households make when investing in human capital. A spatial analysis of the different types of firms was carried out, by drawing up a map of farm households in Italy. Census data from the National Institute

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of Statistics (Istat) were used to describe the main structural and organisational characteristics of the farms. Multivariate statistical tools were used to process the information in the database, so that the different types of Italian farm households could be defined and geographically located.

The diversity among farm types is related to the quality of the human resources available on the farms. There are some diagnostic parameters which can be used to describe this (educational levels, female involvement, young entrepreneurship etc.). The results allowed us to analyse the competence endowment inside the family farm by determining the existence, the types and the strength of the relationships between the characteristics of family farms and certain variables which described the specific local environment and the human capital available to the family.

Background

The human capital endowment of farms is an important factor which must be borne in mind when evaluating the relative competitiveness of local agricultural production systems. Among its components, the investments made in education and training over a period of time are frequently considered to be among the most significant factors when analysing farm efficiency as well as total factor productivity and real wages and income. There is a great quantity of economic theory literature and applied research essays and articles on the returns produced by such investments (see for example Schultz, 1964; Becker, 1993; Johnson, 2000). At the moment it is widely accepted that education and training investment is optimal when marginal returns are equal to marginal costs (Huffman, 2001). In other words, such investments encourage qualified workers to take up off-farm employment, where the acquired knowledge and competence are rewarded by higher wages. This is true for farms where new technology is only adopted slowly. However when extra-farm wages are insensitive to qualifications and competence and agriculture can count on a constant stream of innovations which require new skills, then investment in education and training can ensure good returns inside the farms themselves. Empirical research has found that in developed countries additional schooling increases the likelihood that farmers will be employed in off-farm waged work. This is not necessarily the case for farmers working in the Green Revolution areas of developing countries[2] (Huffman, 2001). Investment in education and training is very sensitive to the time horizon of the choice. Thus, human capital investments made during the later stages of an individual's life are obviously of less value. By contrast, the steeper slope of the graph of the marginal costs of the investment suggests that human capital accumulation should be spread over more than one period (Huffman, 2001).

Census data shed some light on the conditions of Italian agriculture (Istat, 2003). Only about 64,000 people out of more than 2.4 million employed in agriculture have an agricultural science (or engineering) degree or diploma. This number rises to about 470,000 when all types of degrees and scholastic titles are included. A recent analysis found that farms managed by farmers with degrees in Agricultural Science had an average turnover of € 66,876, while the national average was only about € 15,000 (CNEL, 2004). The former work on farms with an average size of 19.9 hectares of farmland, corresponding to € 3,363 turnover per hectare, which is lower than the national level of € 3,409 per hectare. The specific characteristics of skilled farmers can be identified when one considers the turnover/days of labour ratio.

2 The Green Revolution started in Mexico during the 1940s when the introduction of new disease resistance high-yield varieties of wheat, combined with modern mechanization technologies, made this country a net exporter of wheat in the 1960s. Except for Africa, countries all over the world benefited from the Green Revolution: USA, for example, became self-sufficient for wheat in the 1950s and a net exporter in the 1960s; thanks to a new variety of rice, IR8, India is today one of the world's leading rice producers (Briney, 2008)

In their farms this figure is estimated to be € 239 per day, far higher than the national average of € 124 (CNEL, 2004). These data are evidence of the technological gap between the different types of farms, where those managed by skilled farmers evidently adopt labour saving (such as mechanization) rather than land saving (such as fertilization) innovations. On the other hand, it is well known that capital investments substitute unskilled labour but increases the demand for skilled workers (Griliches, 1969).

A logistic regression model for high quality agricultural workers

Census data from the National Institute of Statistics (Istat) were used to describe the main structural and organisational characteristics of Italian farms in 2000. The data referred to NUTS3 territorial detail, i.e. to provincial administrations. A more detailed database, referring for example to local authorities (communes), was not available for all the variables which were considered relevant for this analysis. Table 1 show the variables used in the analysis.

Among other things, Table 1 highlights the high degree of variability of the low weight of qualified workers compared to total agricultural labour. A logistic regression was carried out to identify and evaluate the main factors explaining such variability. The logistic regression was estimated by the OLS method using the logistic transformation of the dependent variable y (GRA in Table 1),

$$\text{LOG}\left(\frac{\breve{u}}{1-\breve{u}}\right) \quad (1)$$

and the fitted values from the regression were transformed as follows

$$\breve{u} = \frac{1}{1+e^{-b\mu}} \quad (2)$$

where x was the fitted value from the OLS regression and β was the estimated coefficient. Data was processed using the Gretl™ v.1.8.1 econometric package.

Table 1 – List of variables introduced in the logistic regression

Variables	Description	Mean	Standard dev.
GRA	Labour days of workers holding an agricultural sciences degree or diploma/Total labour days	0.046	0.031
PRO	Hectares of property/Total farm area	0.779	0.128
BIG	Total area of farms > 50 hectares/Total farm area	0.451	0.179
FAM	Total area of farms using family labour exclusively or predominantly/Total farm area	0.656	0.146
ARA	Hectares of arable crops/ agricultural area used	0.519	0.258
LIV	n. of livestock farms/n. farms	0.347	0.191
TRA	No. of farms owning tractors/No. of farms	0.441	0.225
YOU	Agricultural workers younger than 29/Total agricultural workers	0.137	0.030
MAL	Male agricultural workers/Total agricultural workers	0.649	0.102
AGR	Agricultural workers/Total workers	0.070	0.043

Source: data processed from Istat (2003)

Table 2 synthesizes the main results of the logistic regression[3]. The logistic regression brings up some interesting points. Looking at the structural characteristics, high quality human resources appear preferable in local agricultural systems where farms owning tractors are common, despite the low concentration of agricultural land in the hands of bigger farmers. A worker holding an agricultural sciences degree or diploma is more often found on arable rather than livestock farms. An important result is that qualified workers are more often employed on farms where the family are not the exclusive or predominant source of labour. This result does not necessarily imply that family farms do not invest in agricultural education, but simply indicates that skilled workers, whether they come from agricultural households or not, need to work in conjunction with external labour, giving birth - in both cases - to "capitalist" farms, as they were labelled in the past. With reference to the social factors, the relationship between high quality human capital and the large number of young workers in the total number of local agricultural workers is noteworthy. This result highlights the importance of inter-generational transfer in rural households in improving the qualifications of the human resources in agriculture.

Table 2 – Logistic regression (dependent variable: GRA)

Variables	**Coefficient**	**St. Error**	**T ratio**		**P-value**
Constant	-3.420	0.834	-4.103		0.000***
PRO	-0.459	0.500	-0.918		0.361
BIG	-0.576	0.344	-1.671		0.098*
FAM	-0.932	0.471	-1.981		0.051*
ARA	0.401	0.186	2.156		0.034**
LIV	-1.004	0.278	-3.615		0.001***
TRA	2.108	0.266	7.912		0.000***
YOU	3.384	1.511	2.239		0.028**
MAL	0.422	0.429	0.986		0.327
AGR	-0.912	1.048	-0.870		0.387
RSS	11.164			St. err. regr.	0.346
R^2	0.675			R^2 corr.	0.643
F (9,63)	21.455			P-value (F)	0.000
Log-likelihood	-31.714				

Synthesizing the logistic regression results, today agricultural education investment in Italy is best exploited in regions where farmers preferably employ external labour, use their own tractors and produce arable crops rather than dairy goods or meat. The high percentage of young workers in agricultural employment indicates that agriculture offers concrete prospects of income and employment in these areas. In such areas the low concentration of landholding is principally an indicator of the difficulties faced by young qualified farmers when trying to set up farms on their own land. These elements seem to be the most important ones which policy makers should concentrate on when drawing up labour qualification policies for agriculture.

3 Here the full model is presented because the Maximum Likelihood Ratio test (producing a chi-squared value equal to 3.411 with 3 degrees of freedom corresponding to BIG, MAL and AGR variables excluded because of their low significant coefficients) showed the limited gain of significance coming from the reduced model. Akaike, Schwarz and Hannan-Quinn criteria support this choice.

A Discriminant Analysis of farm households

Deeper analysis of the characteristics of farm households in Italy shows that there are links between the geographical location of the agricultural activities and the role of qualified workers in the farm management. A Linear Discriminant Analysis was made in order to define the different types of farm households and their location in Italy.

The 103 provinces were classified with reference to two parameters. First, the FAM variable described in Table 1: the provinces where the FAM was larger than the national mean were separated from those where the FAM was smaller. In this way an objective, although relative, classification of local agricultural activities was made which took into consideration the importance and the spatial diffusion of household farms. Second, the provinces located in the Northern and Central Regions of Italy were separated from the "Mezzogiorno" (Southern Italy and the islands of Sicily and Sardinia) provinces. This double classification gave us 4 different groups of provincial farms.

Table 3 – Classification groups for Linear Discriminant Analysis

		Type of farm	
		FAM>national mean	FAM<national mean
Area	North-Centre	1	2
	South-Islands	3	4

Table 4 – List of variables for Linear Discriminant Analysis

Variables	**Description**	**Mean**	**Standard dev.**
PLO	No. of plots/No. of farms	5.053	4.558
REN	Hectares rented/Total farm area	0.176	0.125
PRO	Hectares of property/Total farm area	0.779	0.128
SIZ	Total farm area/No. of farms	11.123	9.070
UAA	Agricultural Area used/Total farm area	0.682	0.167
ARA	Hectares of arable crops/Agricultural Area used	0.519	0.258
PER	Hectares of permanent crops/Agricultural Area used	0.200	0.167
LIV	No. of livestock farms/No. of farms	0.347	0.191
MAC	No. of farms using machines/No of farms	0.871	0.072
TRA	No. of farms owning tractors/No. of farms	0.441	0.225
YOU	Agricultural workers younger than 29 years of age/Total agricultural workers	0.137	0.030
OLD	Agricultural workers older than 55 years of age/ Total agricultural workers	0.226	0.050
MAL	Male agricultural workers/Total agricultural workers	0.649	0.102
AGR	Agricultural workers/Total workers	0.070	0.043
DIP	Days of labour days of workers holding a degree or diploma/Total days of labour	0.192	0.065

Source: data processed from Istat (2003)

The classification was created using some quality parameters for human resources on farms as well as some variables which described the main structural conditions of local agriculture. For the educational training indicators the focus was on total number of workers holding some kind of Bachelor's or university degree or diploma rather than on individuals who had completed special agricultural sciences courses, because this latter parameter did not have

significant discriminatory power. Data was processed using the SPSS™ v. 12.0 statistical packages.

The basic assumptions made on multivariate normal distribution, homogeneity of variances/ covariance across groups and correlations between means and variances were successfully tested[4]. Three canonical discriminant functions were used for the classification.

Table 5 – Canonical Discriminant Functions

Eigenvalues				
Function	Eigenvalue	% variance	% accumulated	Canonical Correlation
1	3.607	74.6	74.6	0.885
2	0.963	19.9	94.6	0.700
3	0.262	5.4	100.0	0.455
Wilks' Lambda				
Test of Functions	Wilks' Lambda	Chi-squared	df	Sig.
1 to 3	0.088	225.192	45	0.000
2 to 3	0.404	83.897	28	0.000
3	0.793	21.494	13	0.064

The following tables allow us to synthesize the main results of the Discriminant Analysis. The Structural Matrix shows the correlations within the groups between discriminant variables and standardized canonical discriminant functions. The significance of the coefficients is made clear, on one hand, by the group means for each function, and on the other, by the territorial map.

The classification of Italian farms based on their geographical location was found to be a good choice. Discriminant function 1 separated Northern and Central Italy from the Mezzogiorno. Local agricultural systems with predominantly family labour forces were clearly identified along the vertical dimension of discriminant function 2. Structural parameters rather than human quality resource variables characterised such types of farms. To be more precise, the high incidence of UAA as a proportion of total farm area, of arable crops as a proportion of UAA, the mechanization of agricultural operations and the widespread use of farmland were the most powerful discriminant variables for characterising family farms in Italy. Human quality resources were mainly discriminant factors between the North and the South. Thus, older workers were more common in North and Central Italy, where diploma or degree holders find better conditions for employment in agriculture. This result has to be compared with the large number of workers employed in agriculture in the Southern provinces.

The canonical discriminant functions were used to predict the groups for each provincial agricultural system. The prediction was based on the Mahalanobis distance from group centroid and took into account the a priori probabilities of the farms belonging to one of the 4 groups.

4 With specific reference to the homogeneity of variances/covariance, Box's M test was 892.858, corresponding to a F (240, 14171.189) approximately equal to 2.720.

Table 6 – Structural Matrix

	Function		
	1	**2**	**3**
TRA	0.522*	-0.469	0.064
AGR	-0.444*	-0.106	0.189
LIV	0.371*	-0.029	0.086
OLD	0.343*	-0.326	-0.028
PER	-0.297*	0.148	0.252
SIZ	0.205*	0.131	-0.066
DIP	0.194*	0.007	0.176
PLO	0.134*	0.092	0.056
UAA	-0.177	-0.725*	0.133
ARA	0.099	-0.518*	-0.121
MAC	0.006	-0.464*	0.120
REN	0.306	-0.448*	0.308
PRO	-0.271	0.397*	-0.231
MAL	0.069	-0.253	-0.552*
YOU	0.031	0.189	-0.202*

Table 7 – Group means for the discriminant functions

	Function		
Group	**1**	**2**	**3**
1	1.485	-0.935	0.266
2	1.219	1.183	-0.310
3	-2.464	-0.682	-0.599
4	-2.646	0.856	0.944

Discriminant analysis confirmed the first impressions suggested by the logistic regression: human capital investments in education need the support of positive present conditions and future prospects for agricultural activity. While logistic regression highlighted the importance of the good structural state of the farms, discriminant analysis showed that such conditions are more often found in North and Central Italy.

Figure 1 – Territorial Map

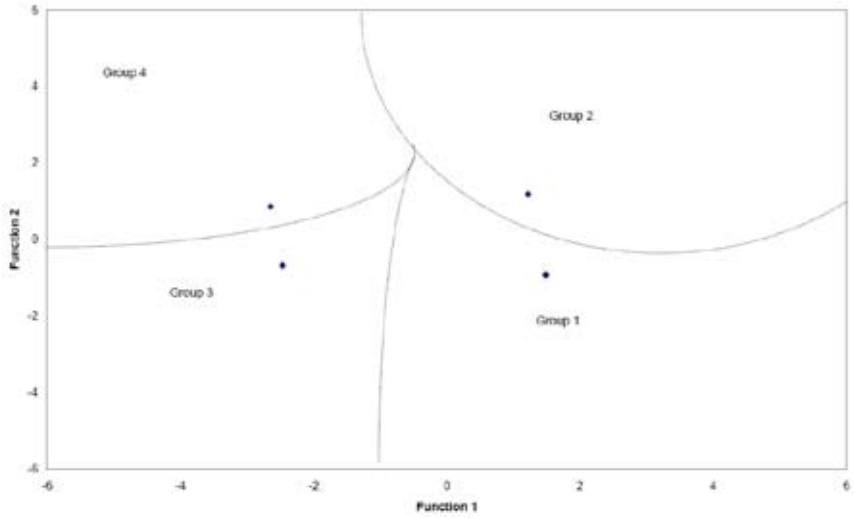

Table 8 – Classification results

	Predicted				
Original	**1**	**2**	**3**	**4**	**Total**
1	32	3	1	0	36
2	4	26	0	1	31
3	1	0	19	2	22
4	0	1	3	10	14
Total	37	30	23	13	103

84.5% cases correctly classified

Some concluding remarks

A map of human resource endowment in Italian farm households was created. Among other things, the most important results confirmed the arguments of the literature on economic theory and also the results of past empirical studies. The results confirmed that there are "two Italy's", mainly differentiated by factor endowments and socio-economic environmental conditions. In North and Central Italy agriculture sometimes offers better economic conditions and prospects for a new generation of skilled farmers. Agricultural science diploma or degree holders have more possibility of finding work in areas where there is significant investment in mechanisation, where arable crops are cultivated and where there are a significant number of extra-family workers in the agricultural work force. This suggests that policy makers have to bear in mind that training and qualifying the human resources employed in agriculture is not a problem of institutional education or training. What is needed is a holistic development plan with structural as well as social and institutional objectives. The specific local economic, social and institutional conditions should be given greater weight in such plans.

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STATE AND PERSPECTIVES IN COMPETITIVENESS OF ONE FARM TYPE IN SERBIA

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Abstract

In the paper is analyzed competitiveness of Serbian family dairy farms in lowland region in 2007, with some aspects of possible perspectives. Globalization process, expected EU integrations and set of free trade agreements will expose Serbian farms in close future to higher level of competition. Identified structural changes, refers on dairy farms concentration and specialization in lowland region in recent years. Estimated model of cost function revealed that family farms with bigger herd size have lower average costs of milk production. Economic efficiency, measured in terms of cost efficiency, shows that larger dairy farms are more efficient. But, not all smaller farms are inefficient. Due to good management some smaller farms are competitive on national market. Milk price volatility in period 2007 to 2009 hurts all farms, but the most farms with higher average costs, which are usually inefficient dairy farms.

Key words: competitiveness, dairy enterprise, dairy farm, milk production, Serbia

Introduction

Cow milk production is one of the most important sectors in Serbian agriculture with 11% share[4] of the agriculture output in 2007. Milk production is traditionally based on family farms that produce over 91% of total milk. About 285.000 farms producing cow milk with small average herd size, just above 2 cows[5]. Cow's population is decreasing with average rate 2.48%, but in last 10 years all decrease comes from central Serbia (highland region). Structural changes are obvious in last decade, especially in lowland region. Number of dairy farms in Province of Vojvodina is decreasing, while cow population is stable, inferring concentration and specialization in milk production (Popovic, 2009). Size and number of commercial family farms increasing, and typically size of those farms varies from 10 to 120 cows in herd. Main causes of this trend are positive effect of dairy policy and stimulating subsidies, as well as vertical coordination with processors.

Globalization process and expected EU integrations will expose Serbian farmers to higher lever of competition. There is also range of free trade agreements with Western Balkan countries, Russia, Ukraine and Turkey. All above mentioned trends refer importance of deeper research of dairy farms competitiveness in Serbia.

Competitiveness is very complex concept. That complexity comes from many dimensions of competitiveness concept. As Zawalinska (2005) stated, citing many authors, there is at list five

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4 Statistical office of the Republic of Serbia and author calculation

5 Ministry of agriculture forestry and water management, Statistical office of the Republic of Serbia and author calculation.

dimensions of competitiveness. They are: wade range of possible applications (from farm to state level), potential (ex-ante) or revealed (ex-post), originated ruts from diverse theories, temporal approach (short-run, long-run) and relative term of application (internal and external competitiveness). Because of multidimensional approach, there is no single theory and no single measure of competitiveness.

Dohlman, Osborn and Lohmar (2003) define that nation's product competitiveness do not rooted in any single outward measure, but ultimately in the quantity and quality of the country's productive resources. These factors determine the relative efficiency of making different goods and, consequently a countries "comparative advantage" in international trade.

Farm competitiveness can be measured on farm level on one market or on farm sector across nations. In last case should be taken in account influence of subsidies, tax breaks, trade protection and other forms of intervention (Barichelo, 1996) which make competitive advantage (trade advantage) more political than economic concept.

Competitiveness measurement on farm level could be conducted on at least 4 stages:

- competitiveness for production factors with other farm's enterprises,
- with other dairy farms in same production region,
- with different dairy production systems and
- with dairy farms in different countries.

In earlier studies, because of lack of single measure of competitiveness, the most used indicators as determinants of competitiveness until now were: cost of production, profitability, efficiency, factor productivity and market share. Citing other authors Jeffrey and Grant (2001) conclude that producer efficiency and its relationship with production costs is a more appropriate measure of competitiveness than simply comparing average total costs of production.

Investigating an efficiency and competitiveness of the small dairy farms, Tauer (2001) compared small with bigger dairy farms. As conclusion he found out that even small dairy farms can be cost competitive with larger farms.

Empirical studies show importance of quality, representativeness and comparability of farm costs data. Jeffrey and Grant (2001) pointed out that farm level data impediments are unavoidable problem and can be experienced in all areas or times period, with higher probability for that in smaller areas and smaller farms. Beside that, usefulness of cost analysis in bench marking competitiveness of milk production is irrefutable.

Material and Methods

To represent cost function, between many functional forms a relatively simple quadratic has been selected as it is analytically tractable. A quadratic cost function can be estimated for average costs of milk production from original data. Total cost of milk production divided by output (number of cows multiplied with average yield) gives equitation for average cost:

$$AC = ax^2 - bx + c$$

Equitation for marginal cost is first derivative of total cost function and it is represented as:

$$MC = 3ax^2 - 2bx + c$$

As determinants of average estimated costs, in practice usually are used: number of cows, milk yield, used agriculture land, prices of concentrate and bulk feed, wage rates, etc. Here all those determinants are examined and cost function estimation is based on those variables who the best explain cost variation.

Economic efficiency is: "the ability to choose the technically efficient output/input combination that optimizes a decision-maker's goals(s), given relative output and input prices" (Jeffrey S., 1992). Achieving higher level of efficiency is desirable goal for farms tending to become and stay profitable and sustainable. Economic efficiency is examined in terms of cost efficiency, with total cost control ratio. Each ratio is expressed in terms of cost per 1 Dinar (RSD) of dairy enterprise revenue. Farms with lower cost control ratio are more efficient.

Material for research is based on two sources. First are databases from earlier conducted researches for Serbian dairy farms in lowland production region in 2003 and 2007, which are source for farm competitiveness on national level. Second source is available data from International farm comparison network Dairy (IFCN), through project of cooperation Serbia with IFCN network. Database of this institution was built in 2000 and rapidly grow up to 2008. Now it represents 80 countries that produce 95% of world milk production. Because IFCN use slightly different methodology, data are not comparable with first source. Farm gate prices from this database are used in further analysis.

In this paper, measuring of competitiveness is focused on dairy farms in lowland production region in Serbia. As dairy farm, here is treated farm with at least 50% revenue originated from dairy enterprise. Farms were grouped by herd size in 6 groups: 5 to 9; 10 to 19; 20 to 29; 30 to 39; 40 to 49 and 50 and more cows. In each group at least 3 farms were sampled and in total sample size were 24 farms (Figure 1).

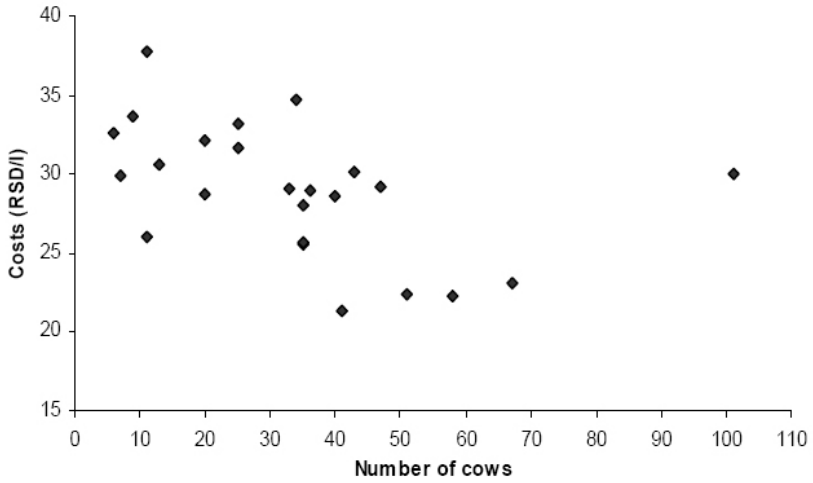

Figure 1 - Costs of milk production per liter for 24 sampled lowland farms in 2007.

In total revenues were included all cash and non cash revenues. Rearing herd replacement and calves were treated as separate enterprises and data about revenues and costs were collected only for cow's milk enterprise. Economics cost concept was applied and for each farm were calculated entrepreneur profit and net farm income.

Results and discussion

Using E-views software numerous of independent variables were examined in estimation of milk production cost function. Finally the model with four independent variables showed the best results and function of average cost in 2007 was estimated as:

$$AC = 35.72586651 - 0.2190378845 \cdot COWS + 0.001650302384 \cdot COWS^2 - 0.00297647414 \cdot MY + 0.6007004142 \cdot CONC + 0.06894880067 \cdot WR$$

$R^2 = 81.88$

$F_0 = 16.26 > F_{(0.01;5;19)} = 4.17$

Where:

COWS	= average cow numbers
MY	= average milk yields (liter/cow/year)
CONC	= concentrate costs (din/kg)
WR	= wage rates (din/working hour)

Statistical properties of the model are good. The R^2 value of 81.88 indicating that above 80% of inter-farm variance in costs is explained and that is emphasized by F-statistics which indicate that model is significant at 99% level. Since the main control variable for the farmer is the number of cows, there was made an assumption that milk yield is fixed for all farms (weighted average yield in sample). That enables to represent cost function as simple quadratic function which is much easier for analytics. Average weighted milk yield in sample was 5,844 liter/cow/year.

According model, in 2007 only farmers with 30 and above cows in herd could earn entrepreneur profit. Results for 2003 production year shows that only farms with 10 and more cows could earn entrepreneur profit (Popovic R, 2006). It's indicates that bottom line of profitability in milk production is moving to the bigger herd size. If farmers are profit maximizing, as model assumes, they should expand herd size to cost minimization level of 69 cows and beyond this to profit maximizing level of 87 cows.

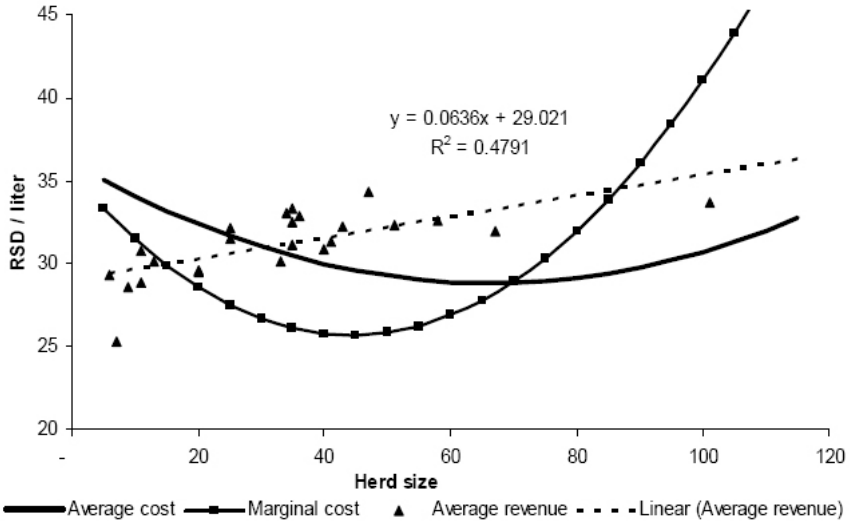

Figure 2 - Estimated cost function of milk production in lowland region in 2007.

From quartile analysis by entrepreneur profit can be inferred that entrepreneur profit was achieved by bigger farms. Top 25% of sampled farms (6 of 24) are not the biggest farms by land area and don't have significantly bigger herds. Source of their profitability could be found basically on revenue side and partially on cost side. Those farms earn highest revenue due to high average milk yield and the highest average milk prices.

Table 1 - Quartile analysis by entrepreneur profit in 2007.

	Highest Quartile	Up/Mid Quartile	Mid/Low Quartile	Lowest Quartile
Average land used (ha)	72	108	33	41
Own land (ha)	23	33	19	17
Average cows number	48	46	26	15
Average milk yield (l/cow)	6,645	5,282	5,776	5,660
Revenue (€/cow)	2,627	2,065	2,166	2,023
Revenue from milk sale (€/cow)	2,106	1,591	1,692	1,512
Milk price (€/100l)	32	31	30	27
Variable cost (€/cow)	1,241	1,226	1,434	1,317
Fixed cost (€/cow)	871	793	896	1,076
Occupier's income (€/cow)	860	427	326	360
Entrepreneur profit (€/cow)	514	46	-164	-369

In Figure 3, it is shown that farms with bigger herds have smaller ratios. That is mean they are more cost efficient. Bigger farms are more efficient, with lower average labor costs and higher labor productivity. It is result of applied different technologies in milk production. Technologies in milking and feeding identified in research are ranging from low mechanized (only milking) at small sized herds to completely mechanize at herds in group 50 and more cows.

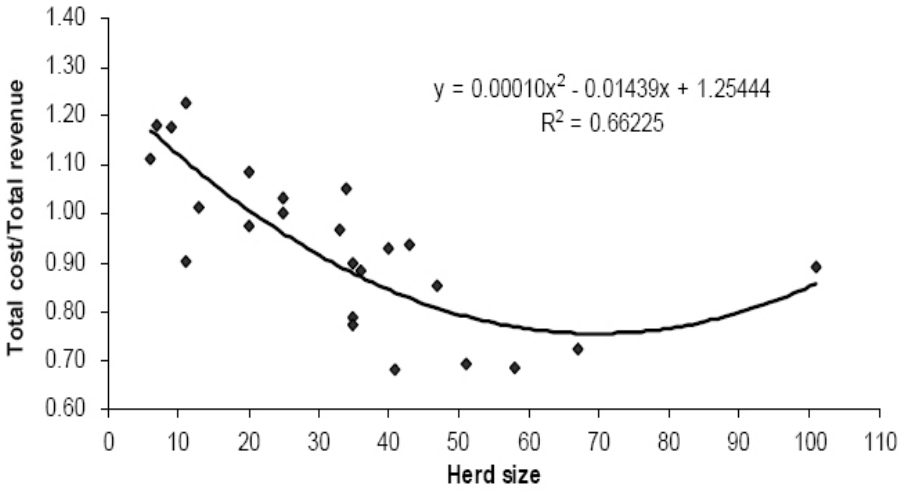

Figure 3 - Economic efficiency measured with total cost control.

But, it should be noticed that there is also few dairy farms, smaller than 50 cows in herd, with economically efficient production. It could be explained only with good management on those farms.

Using "Typical farm" methodology with applied economic cost concept on whole dairy enterprise IFCN – Dairy research center took in account two dairy farms from Serbia RS-10 and RS-84 with 10 and 84 cows in 2007. Comparison of production cost those two with farms in other 43 countries from all continents revealed that Serbian dairy farms in 2007 were cost competitive if compare with dairy farms in Western Europe countries[6]. But, not cost competitive with farms in Oceania, South America, and Asia and ex Soviet Union countries. Competitiveness of larger dairy farms, as well as dairy supply chain in Serbia was also indicated by Berkum S. (2009).

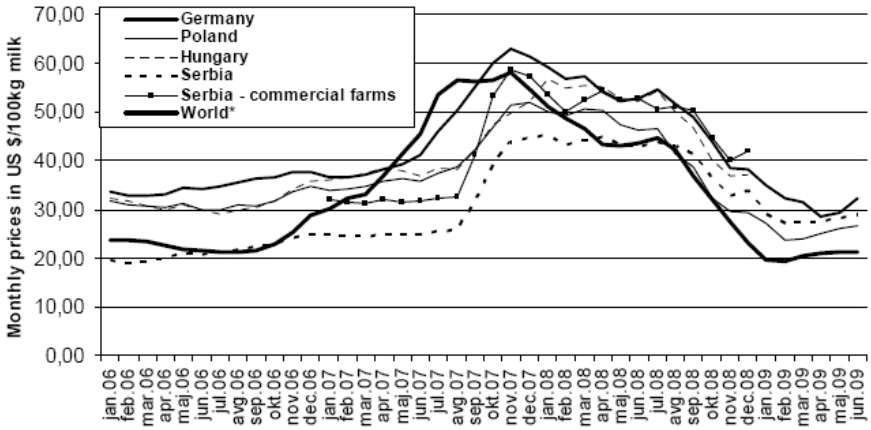

Figure 4 - Average monthly farm gate milk prices for: Germany, Poland, Hungary, Serbia and estimate for the World.

Simple milk price comparison doesn't gives conclusion about competitiveness of milk production. From other side dynamics of milk prices on different markets can give some inference about market integration and farms position on market. No one national market is entirely isolated from world market trends in long term. The milk price transmission on Serbian market (Figure 4) in period 2006 to 2009 shows, it is asymmetric and time lagged.

In 2007 when world market experienced extremely milk price increase, wave of that increase came with 9 months delay on Serbian market. In same year milk price transmission on German and Poland market, was faster and less asymmetric. The reasons for this might be linked to two major facts. Firstly, the Serbian market is not well integrated in to the world market, what is emphasized with fact that either smaller farms or commercial farms didn't get higher prices until September 1. Because of the rapid increase of input prices in the period June-August farmers suffered a loss in dairy enterprise during this three months period. Secondly, slow milk price transmission could be a sign that farmer's position on market wasn't favorable in relation with milk processors. Additional analysis of milk prices for commercial dairy farms shows that when eventually milk processors decide to increase the price for raw milk, they pay much higher prices to commercial farms. Those farms produce high quality of row milk. Only over three months milk prices, achieved by commercial family farms, reached the level of world prices and since April 2008 where close to average prices those dairy farmers got in Germany.

6 Hemme et al. (2008), page 23.

Conclusions

Competitiveness of dairy farms in Serbia was examined using empirical evidence of farms in lowland production region. Dairy farms are the most important type of farms in Serbia with 11 % share of agriculture output just with milk production. Competitiveness was measured with cost of production, profitability and efficiency. Estimated cost function revealed that farms with 30 and less cows were unprofitable, and only farms with herd size above this level could make profit. Original data shows that not all farms under 30 cows were unprofitable, what infers importance of good management practice. Bigger farms are more efficient with low average labor costs and high labor productivity. It is result of applied completely mechanized technology in milk production. Average costs of production are decreasing and average revenue per liter is increasing with increasing herd size. Some farms with less than 50 cows in herd, due to good management are cost efficient, and competitive with larger farms. While Serbian dairy farms with larger herd size are cost competitive with EU farms, higher milk prices, as result of higher milk quality and bigger subsidies gives "competitive advantage" to EU dairy producers. Additional analysis of farm gate milk prices shows that transmission of milk prices in Serbia is time lagged and asymmetric.

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AGRARIAN REGIONS IN SERBIA AS NATURAL FOUNDATION AND MARKET CHANCE IN CIRCUMSTANCES OF TRANSITION[1]

Zoran Simonovic[2], Dragoljub Simonovic[3], Perica Gligić[4]

Abstract

Process of transition movements in Republic of Sebia is in progress. Transition movements have not bypassed agrarian sector. Market agriculture should gain significance along this process. On this occasion we would like to emphasis two elements which affect development of Market Agriculture. Those are regionalization and specialization of agriculture.

In study about agrarian regions in conditions of transition two charts are given, that pinpoint the essence of natural foundation and market opportunities in transition circumstances.

Study of agro-identities starts with introspection of each reagion in respect of its natural values: plain (Vojvodina), hilly (Sumadija), mountain-hilly (Pester). Therefore, plain region is specialized for production of stable livestocking (cattle and hogs), mountain-hilly is based on pasture (sheep and cattle) etc. Regional disposition of some types of livestocking is limited by natural conditions and structure of agricultural area. Essentially, the level of livestock farming has been determined by economic progress of the region and Market development.

The certain other regions are specialized in viticulture, fruit-growing or vegetable growing (vicinity of big cities).

In time of transition, i.e. transferring to Market Agriculture, issue of regional identity has become more actual than ever. This could be best illustrated on the example of forming specialized cooperatives, agricultural markets and companies (plum and apple production and other agricultural cropping) spread throughout particular areas of Serbia.

Key words: agrarian regions, regionalization, specialization, transition.

Introduction

In Republic of Serbia transition was implemented simultaneously with various restrictive factors that were imposed from the outside. Firstly, economic sanctions with all their downsides and culmination in bombing that occurred in 1999. Such circumstances caused the process of transition to begin and stop several times, before it was established. Getting to see direction and tempo of transition in Serbia, International institutions pinpoint inefficiency in institutional and infrastructural reforms as stumbling block and fundamental problem.[5]

Although, it should be stressed that existing system of relations in agriculture, that was inherited

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5 Mihailovic Branko, Parausic Vesna, Simonovic Zoran (2007): Factor Analysis of Business Ambient in Serbia in Ending Phase of Economic Transition, Institute for Economy of Agriculture, Belgrade, p. 28.

from former Yugoslavia was functioning more less successfully in sense of organization of agricultural production as well as providing necessary agricultural alimentary products in difficult conditions of economic embargo and war. Most contributive were farming households and small holdings[6] and of course agricultural conglomerates. Main characteristics of transition during the last decade are:

1. during the last decade the farmers successfully dealt with farming production organization and through open markets they were the main city suppliers with farming products, predominantly with fruit, vegetables and other products.
2. adequate modernization occurred as well as production process was restructuring in coordination with new circumstances. That can be seen by greenhouses and glasshouses for early vegetable growth that also benefited to good offer supply in cities,
3. for conditions of sale or industrial processing, the farmers made necessary changes in their production plans, like forming new attractive productions, like berries and forest fruit, cherries, grapes and similar kinds.
4. during the last years new type of farming estates developed, with more and more contemporary characteristics. The new organization includes defined and purpose-made goods, renewing equipment with contemporary tools and machines for production process and employment of well educated professionals as entrepreneurs-contemporary managers. Those are modern producers that stream towards profitable production, who are well educated and who produce in advance for the market.[7] Even though this kind of producers is quite isolated and rare, they are worth of pinpointing and their significance of mentioning.

For faster development of transition processes and with better results, in our opinion, it is necessary to create conditions in agriculture politics that will catalyze them. This refers to removal of large price disparity in primary farming products prices, as well as prices of same products refined, solving intermediate goods and protective farming materials insufficiency, facilitate credit granting conditions, enlarge number of farming associations for different spheres of their performance. In field of agriculture, 330 companies haven't been privatized (from among many veterinary stations) and 38 more in alimentary industry. This implies that out of total number of not-privatized companies in Serbia, 25% are subjects of agricultural alimentary industry of Serbia.[8] If agricultural politics extents would benefit and fasten agricultural production transition, we are convinced that Serbian way of gradual transition would supply with good results, opposite to unnecessary breakages of the previous system, real transition and gradation would be provided, that is of crucial significance for agricultural production.

Two elements are significant for market agriculture development:

- regional sectioning
- agricultural specialization.

Republic of Serbia includes three agricultural regions. They stand out by their natural foundations as quality of soil, weather conditions, presence of water, altitude and other natural conditions.

As agrarian regions in Serbia are in process of transition, i.e. forming of market relations, in this work we wanted to highlight the regional foundations of Serbia, whereas those foundations are simultaneously a chance for profitable market economy.

In follow-up of the introduction two statistical charts are given, about fruit and vegetable

6 Corporate edition (2006): Agriculture and Rural Development of Serbia in Period of Transition, Association Of Agrarian Economists of Serbia (DAES) and Faculty of Agriculture, Belgrade, p. 89-92.

7 Djekic Snezana (2005): Agrarian Management, Faculty of Economy, Nis p. 19.

8 Eric Dejan, Stosic Ivan, Brnjas Zvonko (2007): Strategical Management in Agrarian Business, Institute of Sciences of Economy, Belgrade, p. 118.

production and crop and herbs production. As figures are given by counties and separately for Vojvodina, they very accurately illustrate ideas submitted in this text. As the statistics provides with information organized by counties, not by agrarian regions and supplies with data about Vojvodina in whole, we have to distinguish that Bor, Zajecar, Zlatibor, Raska, Pirot and Pcin County are of hilly-mountain region and the other counties make rolling-hilly region.

Table 1 - Production of fruit and grapes, 2007.

	Apple		Plum		Grapes	
	Productivity in t	Average yield by the tree in kg	Productivity in t	Average yield by the tree in kg	Productivity in t	Average yield by the vine plant in kg
Republic of Serbia	245228	16,3	680566	16,2	353315	1,1
Vojvodina	83591	17,7	44694	17,1	67813	1,5
Central Serbia	161637	15,7	635872	17,1	285502	1,1
City of Belgrade	19842	13,1	30680	20,6	21611	1,6
Macva County	7746	26,0	65259	20,6	2462	1,2
Kolubara County	3187	15,9	56995	14,4	74	1,1
Podunavlje C.	19287	8,9	6291	8,9	11912	1,3
Branicevo County	5151	14,0	13946	8,0	17209	0,9
Sumadija County	6136	14,7	82512	20,5	13014	1,1
Pomoravlje C.	6245	14,7	32952	15,2	20250	1,0
Bor County	2851	19,7	4307	11,8	36371	1,2
Zajecar County	2428	10,0	8946	8,2	23045	0,9
Zlatibor County	20535	22,1	36258	11,0	0	0
Morava County	18931	23,6	79070	25,5	1131	1,6
Raska County	13264	23,6	50147	23,3	239	1,5
Ras County	11563	26,0	60247	21,9	56161	1,4
Nisava County	5125	11,6	23295	8,9	29066	0,8
Toplica County	4625	12,5	42413	13,1	6382	0,9
Pirot County	1334	5,4	7577	6,0	11811	0,8
Jablanica County	9282	19,0	24561	17,2	30318	1,2
Pcin County	4105	13,6	10416	14,2	4446	0,6

Source: Municipalities in Serbia 2008, Belgrade, 2009, pages 206-209.

Table 2 - Production of industrial and herbal crops, 2007.

	Sugar Beet		Sunflower		Beans		Potato	
	Productivity in t	Average yield in kg	Productivity in t	Average yield in kg	Productivity in t	Average yield in kg	Productivity in t	Average yield in kg
Republic of Serbia	3206380	40579	294502	1903	39224	947	743282	9134
Vojvodina	3109874	40935	276924	1971	8307	1156	275882	12396
Central Serbia	96506	31693	17578	1227	30917	857	517400	8192
City of Belgrade	83938	36495	2255	1659	2211	897	41210	12396
Macva County	1002	20875	642	1558	2350	981	38375	86310
Kolubara County	0	0	144	1321	963	766	15501	5845
Podunavlje County	5671	15753	1160	1255	1246	870	19037	8181
Branicevo County	1076	25023	6984	1508	5060	828	30609	7241
Sumadija County	1766	17314	2104	1216	1563	905	28719	9782
Pomoravlje County	656	24296	173	812	2240	866	21615	9357
Bor County	0	0	2871	815	2652	1373	10615	4486
Zajecar County	0	0	807	865	1044	536	12096	5108
Zlatibor County	0	0	0	0	821	930	67223	10173
Morava County	80	16000	7	1000	687	1041	98173	12399
Raska County	16	8000	2	667	536	787	32339	9195
Ras County	2265	16778	103	1073	1349	912	32861	10301
Nisava County	0	0	7	1000	1734	546	18269	6080
Toplica County	12	2400	1	1000	730	418	6135	4028
Pirot County	0	0	0	0	826	721	7820	5866
Jablanica County	12	1000	308	914	3048	696	20599	5834
Pcin County	12	600	10	500	1857	781	16204	4471

Source: Municipalities in Serbia 2008, Belgrade, 2009, pages 198-201.

Plain region

Law land region includes Panonian plain that is Vojvodina. Soil in this part of country is of best class.[9] Combined with continental climate and its characteristics, with particular regard to properly distributed precipitation, it creates a first class agricultural region.

Irrigation makes great potential of this production, especially Danube-Tisa-Danube Canal. Well organized watering can by itself increase crop yields.

As we stressed earlier these make very convenient conditions for farming, crop husbandry in particular, specifically for corn and wheat production. We should pinpoint industrial crop production – turnip and oilseeds. If here we add developed food industry (oil mills and sugar refineries) then we have production potentials not only for domestic use, but for export, too.

Livestock farming is of barn type and very intensive.

According to indicators agricultural production in plain region up to now was optimally organized through Agricultural and Farming Industrial Conglomerates. During the transition process they have become private large husbandry holdings.

Foreign capital inflow is significant in this area. There is a high interest of foreign investors not only for state owned Agricultural and Farming Industrial Conglomerates oil mills and sugar refineries and similar production capacities, but for investing into completely new production systems.

In addition, it is meaningful to mention modern equipment, well coordinated expert staff and technologically very successful production until now.

Rolling Country

This region spreads over Basin of Velika Morava River, parts of Sumadija, Danube river basin and eastern Serbia. Characteristics of this area are that it leans on plain region and pervades with it, also in continental climate, and soil quality that varies from first to fourth class.[10] This region is mainly fruit-vineyard-livestock husbandry orientated. In this gentle hilled area are situated our most successful vineyards like Fruska Mount, Smederevo County and Zupa County.

Fruit growing is of great significance. Plum was the dominating cultivation, and in the present it is still very important in whole production. Peach, apricot, cherry, pear growth are mostly represented, and processing capacities set for new fruit cultivations which are to be activated and affirmed.

In livestock breeding cattle and pig dominate. Cattle husbandry is of extensive type, and of largest significance for the possibility of open pasture. State holdings occupied only about 7% of the pasture land, and transition to joined land holding is in its initial phase. Otherwise, in this region, as in the countryside in whole, prevail old households, that are to be reconstructed and revitalized with adequate and market oriented organization.

9 Markovic Petar, Simonovic Dragoljub (1973): Economy of Agriculture, Savremena Administracija, Belgrade, pp. 283-285.

10 Vujicic Milica, Ristic Lela, Malesevic Ljiljana (2006): Management in Agrarian Business, Copyright Publication, Kragujevac, p. 108.

Exporting capacities of the region are rich, specifically in fruit growth and animal husbandry, as well as in viticulture, that should be branded and protected. An export capacity also correlates with conditions for food production and other attractiveness that characterize this area.

Mountain agricultural region

Mountain region includes river basins of South and West Morava, Nisava River and Timok River. It is mainly pasture-livestock orientated, though fruit growth is significant, specifically plum and apple cultivation. Livestock husbandry is extensive and in largest part based on pasture. Cattle and sheep dominate the livestock husbandry, and unexpected benefit can bring goat breeding in large capacities, which wasn't the case until now. South-Eastern area of Serbia that is Nis County is established as the center of goat husbandry, where Annual Goat Fair is arranged. Mountain region is also suitable for pig pasture and live poultry.

Mountain Regions is very attractive for livestock husbandry, with high production capacities especially in sheep breeding (sheep breeds of Pirot, Svrljig, Old Mountain, Dry Mountain are significant). These breeds of sheep represented high and fulfilled capacity in the past, when these breeds were exported to almost all continents of the world, and should be restructured and revived in the present times.

Apart from plum and apple, other fruit sorts are grown as quince, pear and rowan.

Vegetable growth is mostly for domestic use, though in South Morava Basin there are some market production capacities. Jablan County represents a leader in vegetable cultivation and production. Long term tradition in production of pepper, tomato and other vegetables combined with contemporary agricultural and technological means can represent a base for guaranteed quality. In South Morava Basin viticulture is developed, and there The Ball of the Vlasotina Grape Growth used to be held. Vineyard capacities are significant in Timok river basin[114].

It is crucial to pinpoint the importance of affiliation agricultural production of this region to other economy branches, like tourism, mountain sports and activities. Forest fruit and herbs collecting possibilities are worth mentioning, like mushrooms, wild nuts, medicating herbs. Some parts of this region are already widely recognized, like Zlatibor, Tara, Kopaonik, Djerdap, Old Mountain, Sar Mountain.

Restrictive Factors in Development of Agricultural Regions

As we emphasized before, Serbia has favorable watering system for primary agricultural production, which is unfortunately not fully exploited. Canal Danube-Tisa-Danube, largest and unique hydro-system in the world is not used for agricultural production, or in very moderate way. River flows are also rarely used for land irrigation. Out of the total cultivated land, only 78 000 hectares (1.6%) is being watered. In Serbia, due to geographical heterogeneity, it is difficult to mark global micro-areas for agriculture, but areas for particular productions can be differed (wheat, industrial cultivations, fruit, grape, livestock, etc.), which actually is of

11 [4] Simonovic Zoran, Simonovic Dragoljub, (2009): Agricultural Regions of Serbia during the recession, Regional Development and Demographic Flows of South-Eastern Europe, University of Nis, Economic Faculty of Nis, p. 123.

most importance for politics in agricultural economy.

Restrictive factors in agriculture and agrarian sector are presented in decrease of demand and consumption of agrarian products on domestic market, and unfavorable relations and conditions in foreign exchange of agrarian goods[125]. Greatest decrease of production range occurred in livestock husbandry; whilst intensity of production descends in crop production was slower and more gradual. Detrimental state in viticulture and vine making is manifested through grape and vine production decrease, fall in competitiveness of domestic vines followed by amplified vine import.

Changes in fruit growth were of stagnating character.

One of the main features of Serbian agricultural regions is their unbalanced development. Most distinctive difference in developmental stages is between Plain and Mountain Region. Only 3% of land in mountain region was state owned, which means that this area is prevailed by small estates, divided into ten parcels by household, which slowed down natural process of land concentration that was initiated but never adequately finished. The state should reactivate and then bring this process to final stage. Production in agricultural regions of law land and mountains was mainly orientated towards fulfillment of their own needs, with almost no introduction to market conditions. Due to these circumstances, production is defined as excessively wide and expertise found only in traces.

Gentle hilled and Mountain Regions are both poorly equipped with agricultural means, in comparison to Plain Region.

Conclusions

1. Three agricultural regions of Serbia reveal diverse natural preconditions for agricultural production. While in plain region crop production prevails, industrial crops and barn livestock husbandry, in rolling country dominates fruit-vineyard-livestock husbandry and in mountain region livestock husbandry and fruit and vineyard production. In existing conditions of recession rolling country region and mountain region can offer berries (strawberry, blackberry, and raspberry) for export, where we already achieved significant results. Though the word is overwhelmed with recession, low flexibility of food demand requires production. This stands as the unique chance of agriculture in time of recession, when many needs and commodities are cast aside, particularly immovables, cars and similar. Regarding affirmation of regional-agricultural identity of Serbia by the regions, Sumadija County could specialize in plum and berry production, Sjenica County for Sjenica's cheese, Old Mountain area for old-mountain hard cheese production, River Jablanica Basin County for vegetable growth, etc.

2. Unbalanced economical development among regions is of great importance. Plain area is highly developed and mountain region considerably behind, not only because of natural conditions, but above all for social, economy and historical circumstances.

3. We believe that in actual present moment, all regions have a chance in agricultural business and entrepreneurship to start and organize production or redefine acquired competitive advantages for specific agricultural products.

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CONSUMER PERCEPTION TOWARDS TRADITIONAL SERBIAN AGRICULTURAL AND FOOD PRODUCTS[1]

Vlade Zarić, Danijela Petković, Milorad Radošević[2]

Abstract

Market success depends in large part on how well consumer behaviour and perception supplies understand. They need to understand how consumers evaluate products characteristics, gather information regarding various alternatives and use this information to select specific product.

The object of this research was to determine consumer perception of Serbian agricultural and food products and especially perception of home made products. In October 2008, a research was conducted in the Belgrade market on a sample of 338 persons. The results were analyzed using univariant statistical analyses.

The results of this research can be used by producers for defining marketing activities and by researchers to conduct further research in this field.

Key words: traditional agricultural and food products, territorial competitiveness, consumers, the Republic of Serbia.

Introduction

Production of agricultural-food products in Serbia is constantly increasing in the last few years, and there is a surplus in the foreign trade of these products (Zarić, 2008). However, most of these products are exported as "non-name" (Zarić, Vasiljević, 2007). At the same time in the domestic market there is significant number of products of foreign origin. Producers of agricultural-food products in Serbia will have a greater attention given to the requirements of customers if they want to stay competitive (Kotler, 2008).

Perception and requests of the consumers is possible to estimate by observing purchase and consumption or by research of consumer behaviour. Proper knowledge of the perception of consumers is one of the prerequisites for successful marketing agricultural-food products. Analysis of consumer perception is an important part of the research on the basis of which the formulation of commercial policy is made. Perception research combines the elements of psychology, sociology, anthropology and economics (Albaum, Smith, 2005).

1 This papers the result of the project financed by the Serbian Ministry of Science. Therefore the authors would like to express their thanks to the Serbian Ministry of Science for providing support for the research.

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Methodology

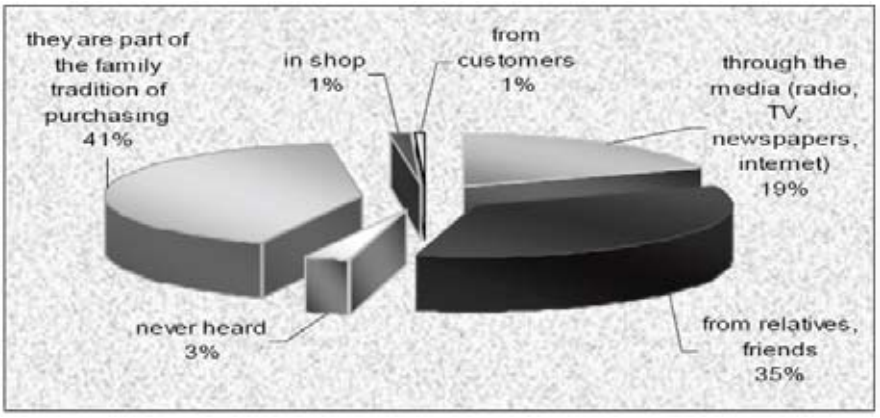
The aim of this paper is to determine the relationship of consumers to the traditional Serbian agricultural-food products. Data were obtained on the basis of the field research organized in two steps of which one was in the form of a closed type of survey, for consumers, and others, open type, intended for experts in the field of agricultural economics. The information obtained by survey were analysed using SPSS. Based on consumer perception the marketing strategy could be defined. Moreover expert opinion on trade marks and brands could help in product positioning (Zarić, et al 2008).

Results and discussion

Survey was conducted for customers in the territory of the city of Belgrade, on a random sample of 338 persons, among which there was more women, 64% and 36% man. Age structure was determined by category, below 17 years about 1%, the three groups of 18-30 years, 31-50 years, 51-65 years, were equally by 32% each and the group over 65 years some 4%. Most respondents had a higher and a high degree 57%, secondary education 37% and the remaining part the elementary education.

In most cases, purchase of domestic products is a part of tradition in households (Graph 1). The most common form of obtaining information about these products is from the mouth to mouth. These two ways of gathering information on the domestic products are dominant in the opinion of 76% of respondents. Advertising through different types of media is an important source of information for one fifth of respondents. Almost all respondents have awareness of local products that are listed in the survey.

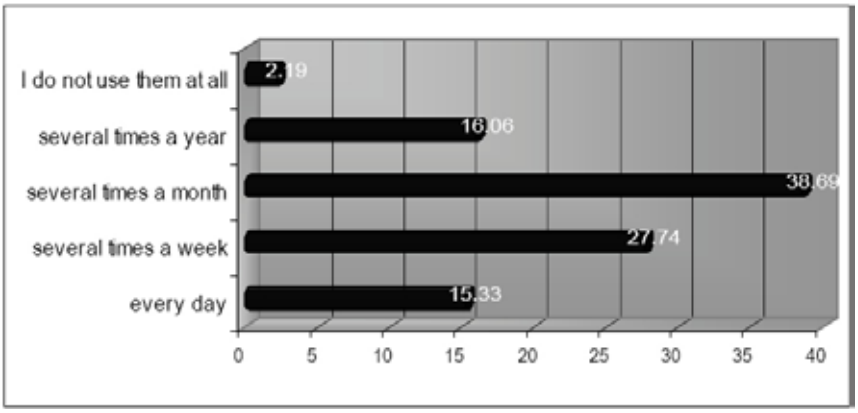
Graph 1 - Sources of information on traditional products



Source: Survey

Domestic agricultural-food products, as shown in the graph 2 are relatively often consumed in households, because 43% of respondents said that they used at least several times a week, while 15% use them daily. There are negligible numbers of respondents who do not use these products.

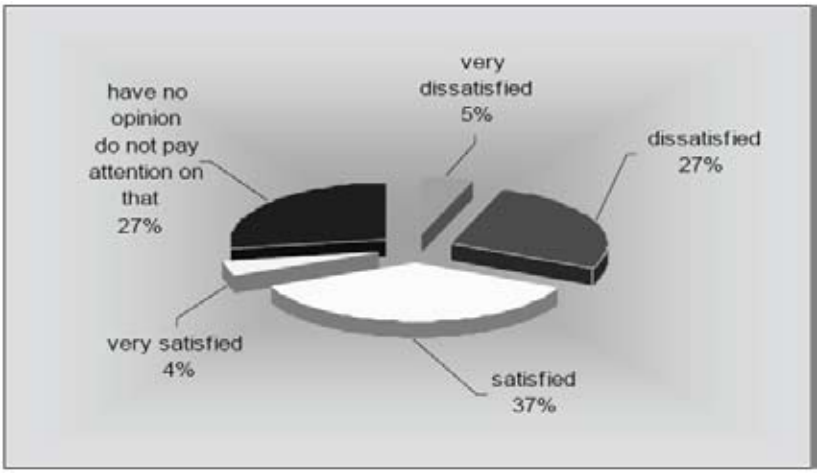
Graph 2 - Frequency of tradition product consumption/purchasing



Source: Survey

In terms of promotion of these products (Graph 3) it is interesting to point out that the small number of respondents (4%) are very satisfied, or dissatisfied (5%). Satisfied with promotion are some 37%. However most of the respondents were either dissatisfied or did not have any opinion on promotion. These research results point to the conclusion that marketing activities aimed at providing appropriate information on domestic products to consumer are one of the key factors for successful selling. Because the fact that almost one third of the respondents has no opinion about the promotion we could conclude that past activities in this field had not given satisfactory results.

Graph 3 - Consumer opinion about promotion of traditional products

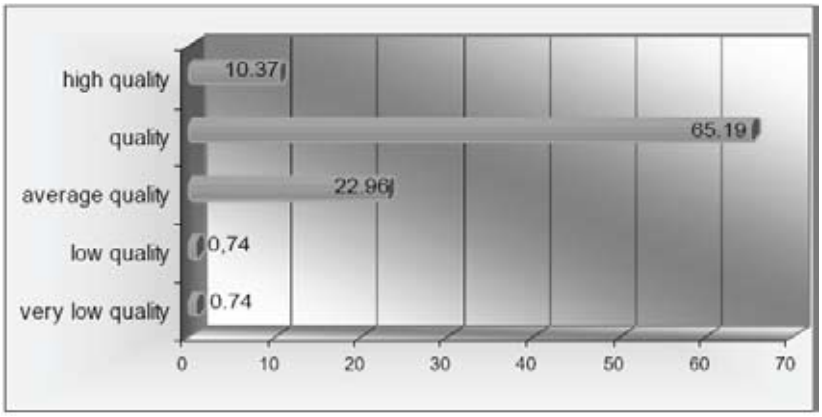


Source: Survey

In terms of quality (Graph 4) almost all respondents believe that local products are of good quality and some 10% of respondents believe that those products are extremely qualitative. However, almost half gave the assessment that the prices of domestic products are more than expected, while some 38% believe that the price is fair. In favour of this is the answer to the question "What would you change at the first place by the mentioned agricultural-food products?". The largest number of interviewed persons stated out that the price changes (42%) and packaging (22%)

are most important. On the basis of this we can conclude that the domestic producers have to be very careful in the implementation of price strategy because it may lead to significant decrease of products consumption due to high prices. It can also be recommended to adjust commercial packaging to the buyer requirements.

Graph 4 - Quality of traditional products

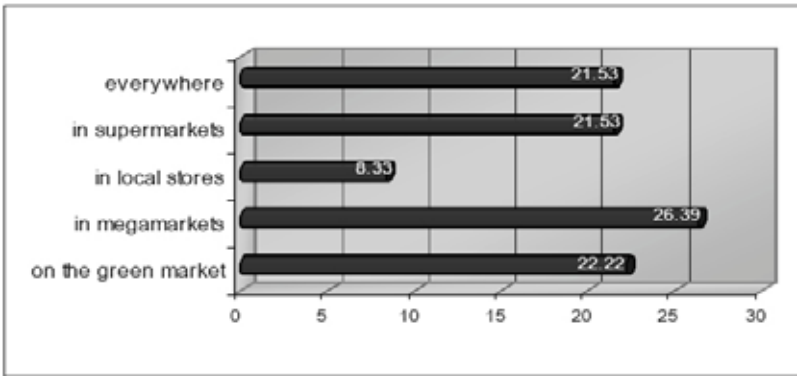


Source: Survey

Purchasing decision is based on quality (average score 4.67) and then on price (3.97). Packaging size and location of sales have a moderate impact on the decision to purchase, while consumer awareness of products has a small role. Evaluation of the above mentioned characteristics was carried out on a scale of 1-5, where 1 indicated the lowest importance and 5 the highest.

Products of domestic origin are usually purchased in mega markets (26%) and almost equally in super markets (22%) and green markets (21%) or on any other place (22%). On the basis of this (Graph 5) can be concluded that domestic producers must dispose of the product with sufficient amount of standard quality during the entire year so that their product could be offered in the larger commercial chains. Given the small importance of small corner shops in selling traditional products (8%), manufacturers can not count on this channel of distribution.

Graph 5 - Purchasing places of traditional products

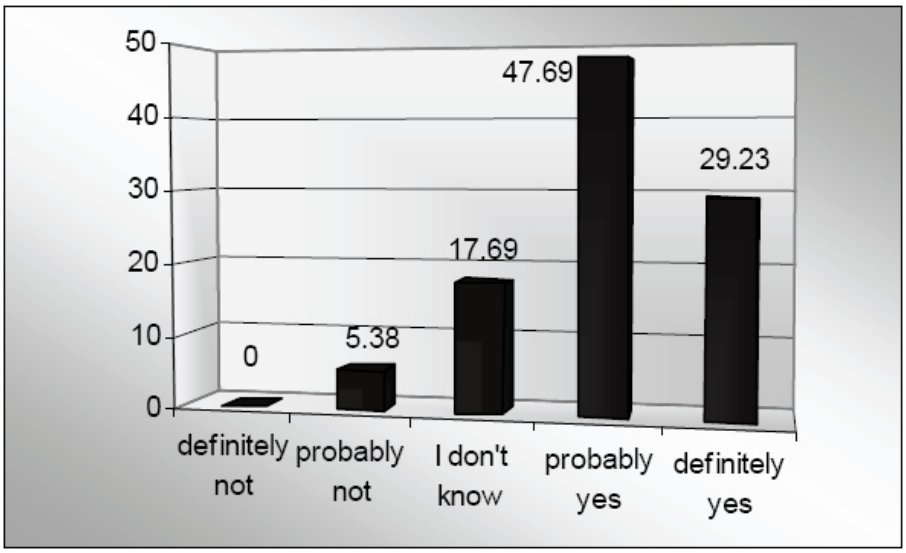


Source: Survey

Almost 80% of respondents believe they would buy the same traditional domestic products in the future, which shows that products enjoy confidence. Perhaps the results depend partly

on marketing activity of the Serbian government over the Ministry of Trade "Buy domestic products" which was carried out. At the same time, there is a higher confidence in product than in trader, because some 64% of respondents answered that they change place purchasing, but could not provide answer how often.

Graph 6 - Willingness to buy traditional products in future



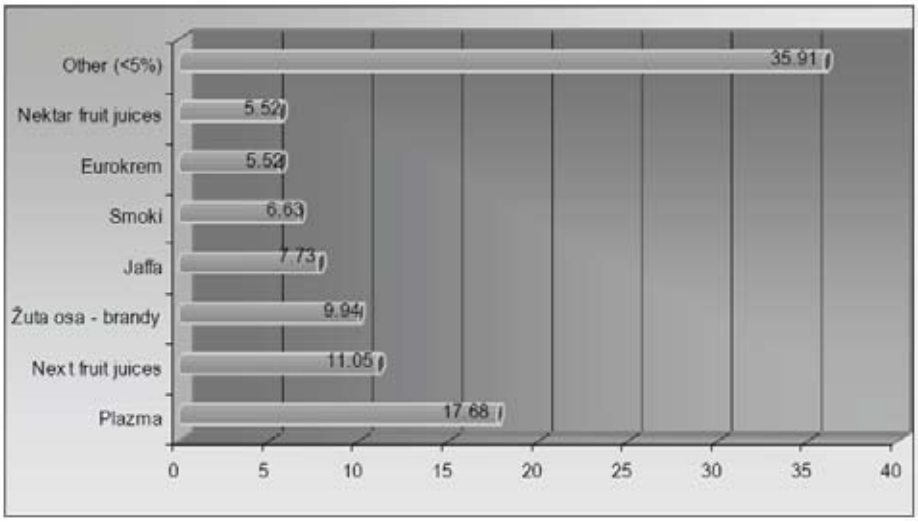
Source: Survey

All respondents would recommend some of the domestic products, and there are also a large number of products that are known only at the local level. It is interesting to point out that there are groups of consumers, some 20%, which only buy imported products, which is an additional challenge for domestic producers and traders. However, this group stated out that reason to buy foreign products is the absence of domestic in supply, such as olive oil.

At the same time, the open-type survey was carried out whose aim was to obtain expert opinions on agricultural-food products no matter how they are produced industrially or in households. This poll was conducted on symposium of agrarian economists with international participation on the occasion of 45 years of the Department for Agricultural Economics, University of Belgrade in October 2008.

On the basis of this survey the following results were obtained. The most popular brand-food agricultural products are: "Plazma", "Next", "Zuta osa", "Jaffa", "Smoki", "Eurokrem", "Nektar" (Graph 7). It is interesting to note that the Jaffa and Smoki are most popular in the older population, while the Next juice is known in the younger generation. All other stated products are popular independent of age of pulled person. All other agricultural-food products that are mentioned in the survey have less than 5% of the votes of respondents.

Graph 7 - The most popular domestic agricultural and food products recognized as trade marks and brands in Serbia



Source: Survey

The most successful domestic manufacturers of agricultural-food products are Imlek, Stark, Bambi, Carnex, Swisslion Takovo, PKB, Rubin Krusevac and Vital. All the manufacturers have better position among the older population, while Stark by younger population. The biggest difference is by PKB (awareness by older 20% and 3% by young responders).

In the survey it was a question regarding main characteristics of domestic agricultural products (Table 1). The answers indicate that the quality of the product is in the first place, following by package design and in third place is a good advertisement. Price is important for some 6% of respondents. All other characteristics are of minor importance having less than 5% answers.

On the question "What are the main prerequisites for the creation of successful brands?" on the first place was given the product quality, followed by good advertising and packaging. Market observation, product placement and appropriate price policies are also important.

Table 1 - Main characteristic of trade marks and brands

Characteristics	**%**
High quality	35,66
Packaging, design	13,95
Advertising	12,79
Product price	5,81

Source: Survey

The most important advantages of domestic brands agricultural-food products (Table 2) are quality, tradition in the production, domestic origin of products, favourable price and safety. Consumer confidence, regional specifics and environmentally friendly production do also play an important role.

Table 2 - The most important advantages of domestic brands

Advantages	**%**
Quality	34,53
Tradition in production and domestic origin	12,23
Favourable price	10,79
Safety	10,07
Consumer confidence	7,91
Regional specifics	7,91
Environmentally friendly	6,47

Source: Survey

The greatest disadvantages of domestic brands of agricultural products (Table 3) are poor marketing, changeable and not the highest quality, as well as, inadequate packaging. In terms of opportunities for the creation of brands, attention should be primarily taken for the development of marketing and production of invariable quality and finally the existence of an appropriate business environment.

Table 3 - The most important disadvantages of domestic brands

Disadvantages	**%**
Poor marketing	35,38
Changeable and not high quality	17,69
Inadequate packaging	16,92
Inappropriate state policy	9,23
Narrow assortments and low demand	8,46
Lack of human resources	6,92
High prices	5,38

Source: Survey

The greatest potential (Table 4) to become brands in the opinion of the respondents have Serbian brandy, cheese and traditional delicatessen. It is interesting to point out that in terms of potential there is a lot of uniform distribution of answers by groups of products.

Table 4 - Possible brands of agricultural and food products

Products groups	**%**
Brandy	13,61
Cheese	10,06
Traditional delicatessen	10,06
Milk Cream - kajmak	9,47
Ajvar	7,10
Wine	5,92
Raspberry	5,92
Products of fruit and vegetables	5,92
Fresh and dried fruit	5,33
Frozen finished products	4,14

Source: Survey

Conclusions

On the basis of this research the perception of consumers towards the Serbian agricultural and food products are determined and for those manufactured in households or produced in the industry.

Most consumers have positive attitudes towards products manufactured in the households. Consumers believe that these products have a high quality, are produced in the environmental friendly way and would gladly recommend them to others.

As the possibility of improving characteristics the most important are unchangeable qualities, more marketing activities and improved packaging design. As with traditional product made in households, industrial products enjoy consumer confidence and there are brands that are widely known.

On the basis of research results in could be concluded that the price is less important parameter than product quality. However, it must be taken into account that the answers in terms of price are adjusted to society opinion that product quality is crucial by decision making. However, purchasing decisions could be quite different to these findings.

Respondents believe that there is a large number of products that could become a brand but having in mind the structure of answers one could concluded that neither one of them have enough potential for success.

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CHALLENGES FOR THE FLEMISH AGRICULTURAL RESEARCH INSTITUTES TO SUPPORT AN INNOVATIVE AND COMPETITIVE AGRICULTURAL SECTOR

Anne Vuylsteke, Dirk Van Gijseghem[1]

Abstract

Agriculture is faced by permanent evolution and it is expected that this trend will continue in the next decennium. The question is what challenges lie ahead and which types of agricultural research can support the sector in order to retain its competitive power by the year 2020. To address this issue, a multi-stakeholder and multi-disciplinary process was initiated in Flanders. The process outcomes learn that two types of action are needed. Firstly, there is need for a focused knowledge production in 5 thematic fields. Central issues hereby are an efficient agriculture, the broadening of the value creation model of agriculture and the increasing sustainability of production. Secondly, efforts should be made to improve the organisation of research with emphasis on participation, anticipation, meta-coordination and validation of research outcomes.

Key words: Research organisation, knowledge networks, innovation

Introduction

Agriculture nowadays faces a rapidly growing demand for biomass in many different forms. This not only concerns food and feed, but the demand for bio-fuels, diverse materials, health-promoting substances and recreations is also increasing. At the same time, the sector is confronted with a shrinking natural resource base and the existence of numerous interactions between human and natural processes into account (EFFP, 2005; OECD-FAO, 2008; SCAR, 2007; UK Government Cabinet Office, 2008; Van Braun, 2007).

Although this context is extremely challenging for farmers, both in Flanders and abroad, it also provides immense opportunities. The agricultural sector must guarantee and increase both the natural and the social capital which are entrusted to her and search for synergies with e.g. the chemical and pharmaceutical industries, the retail sector and environmental actors. It should not only focus on Flanders, but strive for embeddedness within an international framework.

Agricultural research can support the sector in meeting these objectives through the optimization of the existing production processes and by supporting the search for new and innovative applications for agricultural products and processes. A vigorous and focused knowledge production will thereby have to anticipate to the future demand for new technologies, policy instruments, and forms of cooperation. The Platform for Agriculture Research acknowledged these challenges and started in 2007 a process to identify the long-term priorities for Flemish agricultural research.

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This paper focuses on the outcomes of this process and describes the challenges for research institutes to develop knowledge and techniques that support the agricultural sector to maintain its competitive position in the next decade. The second section starts with a short discussion of the process of priority-setting. Section 3 gives an overview of the main fields in which additional knowledge is necessary. But only putting forward priorities will not create dynamics, efforts should also be made to guarantee that the required knowledge is produced and that the research is efficiently organised. Starting from the present situation, section 4 explores which actions can or should be taken in order to come to a solid research organisation that is capable of supporting a competitive and innovative agricultural sector. The concluding remarks of the paper are formulated in the fifth and final section.

Setting long-term priorities to support an innovative and competitive agricultural sector

Foresight and priority setting are hot topics and several dedicated processes have been initiated. The German FUTUR project (Cuhls & Georghiou, 2004; Smits & Kuhlmann, 2004), the SCAR exercises (SCAR, 2007; 2009), the Rural Futures Project of DEFRA (Future Foundation, 2005) and the efforts by IAASTD (2008) are only a few examples. In Flanders, a consultative approach was adopted to set the priorities for agricultural research.

The process (see Figure 1) consisted of five consecutive phases and started with the consultation of ca. 40 national and foreign experts on their long term expectations for the global agricultural sector. Central element in the outcomes is that agriculture is an activity at a crossroad of natural processes and human systems, and the sector is, as a consequence, liable to a very broad and complex network of influencing factors. Firstly, there is a rising demand for food products, which is (for several reasons) not followed by the supply of agricultural products. A second element is the depletion of fossil fuels, which leads to the need to rethink the energy infrastructure and to reflect on the possibilities and restrictions of agriculture as a supplier of bio-energy crops. The need to improve the balance between human activities and the ecological needs, the climate and the restricted natural resources is a third factor that will influence the future developments of agriculture. Next, there is the restricted availability of arable land and the rising pressure from other functions in the countryside. Fifth factor is the globalisation of commercial flows, which connects prices with the world market, but also leads to higher price volatility and finally, there are the possibilities of new technologies (provided that a social consensus can be found).

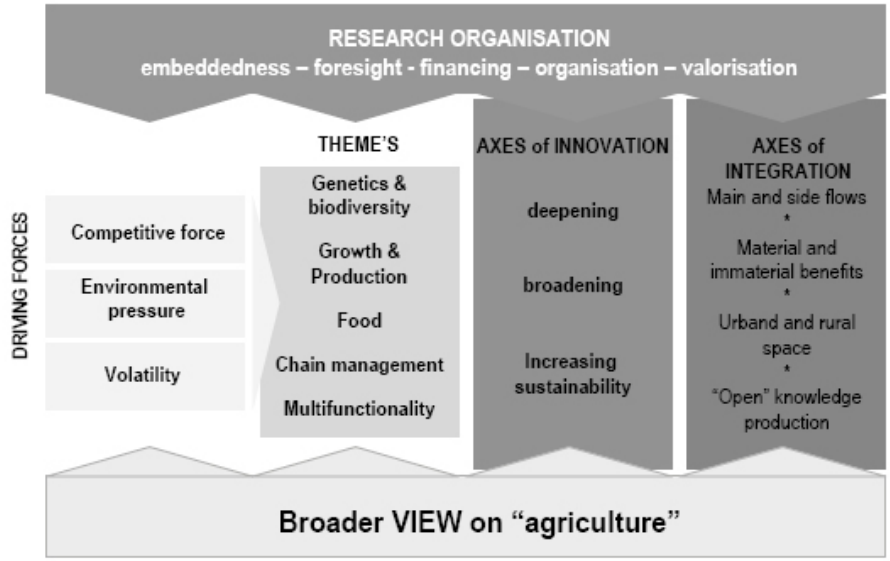

Figure 1 - Overview of the process outcomes

Based on these priorities, three future needs, from which society expects that they are addressed by agriculture, could be identified: (i) the need for a knowledge production which enables the raise of productivity and cost-effectiveness of agricultural production, (ii) the need for a knowledge production which helps agriculture to raise the social appreciation and to reduce the impact of negative externalities which are linked to its activities, and (iii) the need for an anticipative (foresight) capacity that allows to align research activities with unexpected developments in the matrix of external factors.

In the next phase, a group discussion with the members of the Platform of Agricultural Research learned that advancements are needed in five research fields to address these societal needs: (i) genetics and biodiversity, (ii) optimization of growth and production factors, (iii) enforcing supply chains, (iv) improving quality and the societal role of agricultural food products and finally, (v) multifunctional agriculture. The discussion furthermore revealed that it is also necessary to question the research organisation. Each of these topics was further developed by a working group consisting of wide array of scientists and other stakeholders. Based upon the researchers' expertise and taking into account the information gathered during the first phase of the process, these working groups identified research questions that need to be addressed in the future. These research questions were then prioritized according to their sense of urgency, the relevance for the Flemish situation, the existence of a sufficient knowledge base and the possibilities for validation. Only those questions that received sufficiently high scores were sustained and these were consequently grouped into a "White Paper on Agricultural Research".

Focused knowledge production

As was mentioned in the previous section, the process learned that there is a need to focus the Flemish knowledge production in five fields and around selected research questions. Each of these fields is shortly addressed in the next paragraphs.

Genetics and biodiversity

Research that aims to increase the sustainability of production and products not only requires an improved understanding of the development of plants and animals, but also from the role of genetic factors and environmental conditions. Research should therefore develop the correct techniques, methods and strategies. Given the importance of genetic heritage, it will also be crucial to maintain and use the existing biodiversity.

Additionally, new techniques are necessary to cope, in a sustainable way, with threats that may influence the quality and the quantity of the production. This concerns not only new substances to protect the plant and animal production, but scientist should simultaneously develop new strategies.

It is furthermore necessary to continuously strive for added value and broadening of the market. This can for example be realised through the improvement of local niche species or races and the development of new crops.

Optimisation of growth and production factors

Research should help to improve the productivity and output of the plant and animal production. Knowledge of the intrinsic potential of the different processes is of vital importance and can contribute to the development of new technologies that optimally exploit the potential.

Given the evolving consumer demand, there are also possibilities for new products, diversified production and the processing of primary raw materials into energy. Sustainability of new and existing production processes, described by clear criteria, must be the guiding principle. Important issues in this field are more eco-efficient production processes and waste reduction in supply chains.

Finally, the efficiency of individual farms must be raised through the optimal use of production factors and support for company-specific management decisions.

Chain management

To valorise products maximally, demand-driven supply chains, which innovate in response to social, technological and environmental developments, must be developed. Research must also contribute to the (safe) valorisation of secondary and waste streams and support farmers' value creation efforts through a performing chain organisation.

To reinforce the chain position of the primary producers, new mechanisms should be developed to distribute value and risk over all chain actors and to improve both horizontal and vertical cooperation. To support Flemish farmers that opt for an export strategy, it is important to have a good knowledge on their relative strengths and weaknesses and on the impact on the entire chain to do so successfully.

Quality of agricultural products and the societal role of food

Product quality, food safety and consumer perception are central issues in the optimisation of food production. The development of quality standards, performing quality and control systems, criteria to monitor the sustainability of production and consumer research are essential.

There are also possibilities to extend the market through the exploitation of the intrinsic

heterogeneity of agricultural products and the creation of added value for region-own products. Agriculture can furthermore provide raw materials for the agro-food industry and other sectors.

Sustainability criteria must be used to communicate with consumers and other stakeholders on food, diet, sustainable food production and the social importance of the agro-food production chain. By doing so, consumers receive arguments for a more justified food choice and a safer use of food.

Multifunctional agriculture

Next to the traditional products, multifunctional farmers also produce outputs which are requested but often not remunerated by society. At present, the farmer's efforts are almost exclusively valorised by the government. New instruments must be developed that help to recognize the non-commodity outputs of agriculture and to measure their value.

It is however not enough to validate these non-commodity outputs, but efforts must also be made to increase this output through the convergence of functions. This not only concerns the optimization of existing function combinations, but new combinations should also be established. Other important topics are the enhancement of the synergy between urban and rural areas and the optimal use of the available area by means of integrated production models.

Although these five research fields differ largely, there are also important similarities. Agricultural research should namely realize developments in three main innovation areas: (i) the deepening of the existing processes and competences in order realize an efficient production system, (ii) the broadening of the value creation model of agriculture and (iii) an amelioration of the sustainability of production.

Implications for the organisation of the research activities

Throughout the discussions, it became clear that the outlines of a new, integrative agriculture paradigm are emerging (Figure 2). Traditional contrasts – like the opposition between main and secondary flows, urban and rural space and commodity and non-commodity goods – will be transcended into a new holistic concept that considers agriculture as the integral value creation on the basis of natural resources. The rise of concepts such as bio-based economy, multifunctional agriculture and metropolitan agriculture already announce this transformation.

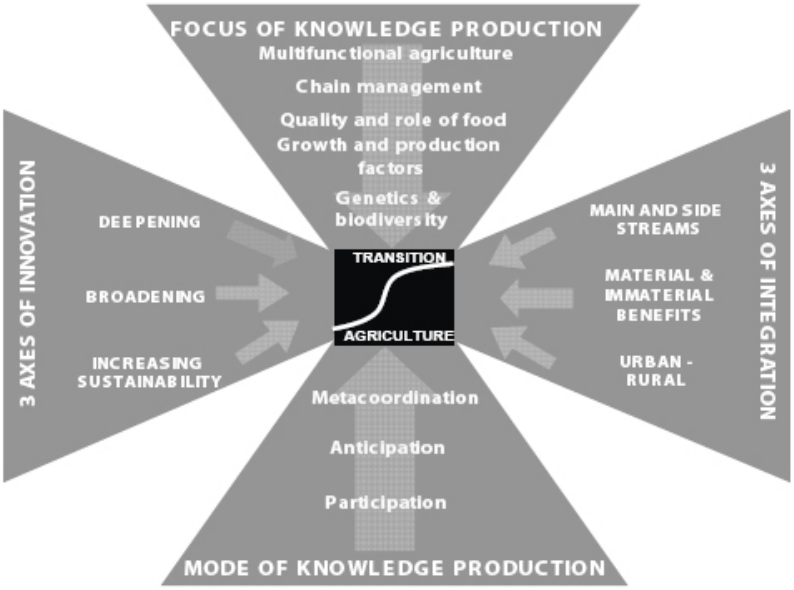

Figure 2 - Elements influencing the transition towards a new agricultural paradigm

The transformation can however not be realised through substantive work only, but should also be impregnated in the organisation of research and knowledge production. Four challenges should thereby be addressed: (i) to realize a higher degree of participation through cooperation with institutions, companies and related fields, (ii) to make research more anticipative so that it proactively searches for new opportunities or the prevention of possible risks, (iii) the creation of a body that provides meta-coordination on financing, cooperation and competences and (iv) the development of new strategies to valorise research results. Each of these challenges is now shortly discussed in the next paragraphs.

Participative research as a starting point for innovation

A first challenge for research is to embed itself in the user community by establishing cooperation with other institutions, fields and businesses. Research can in this way evolve towards a more open process of knowledge production, including a demand-driven component and active involvement of beneficiaries.

The new paradigm will moreover lead to unprecedented, fundamental questions concerning the use of technologies (such as genetic modification or nanotechnology), the role of agriculture in climate change and adaptation and the ways in which commodity and non-commodity outputs can be validated. Interaction between researchers, sector and society in general will be essential to address these issues.

Finally, research must also anticipate to the emergence of opportunities or threats and start a proactive process of knowledge production. The evolution towards knowledge networks, with special attention for agricultural and food companies will be a basic condition. The dividend that results from an improved embeddedness is plural: gains in efficiency and effectiveness of the research, better validation of the results and creation of a basis for co-financing by the sector. Permanent efforts should thus be made to support the positive return in research dynamics.

Putting forward priorities and development of a foresight capacity

Flemish research traditionally had a bottom-up approach: individual scientists set the topic, the objectives and the methods of their research. Although this approach has lead to an excellent knowledge basis, it is commonly adopted that evolution towards a knowledge economy requires focus so that the involved researchers can distinguish themselves and become (or remain) world players (Debackere, 2008; Goorden, 2005). Specific for agricultural research, the fields discussed earlier can serve as a starting point. Within each of these topics, research must aim to deepen the existing competencies in intensive and efficient agriculture, to broaden the value creation model and to make production more sustainable.

At the same time, a foresight body should be started to proactively coordinate research in function of emerging opportunisms and threats. Not only researchers should be involved in this foresight process, but all relevant actors and organisations and in extension the entire society.

Towards a meta-coordination of financing, competences and organisation

A third challenge to realize the transformation of the agricultural sector concerns the organization of research. There is need to improve the collaboration between researchers and the sector, to maintain competences and to improve funding. Each of these issues is addressed in the next paragraphs.

Financing

Although Flanders scores relatively well on the Lisbon targets for the funding of agricultural research, there is still room for improvement. A large part of the funding is namely provided by the government, there is a fragmentation of research resources and it is hard to find funding for new approaches.

The fragmentation of research resources leads to important efficiency losses and a defective valorisation of the results. The development of an overarching research strategy that includes all financing canals and the entire research chain could be a valuable strategy. This strategy should simultaneously aim for a better harmonisation with the European and international research frameworks.

Another issue is the fact that it is nowadays very difficult to find funding for innovative research trajectories. This is in contrast with the need for new research strategies (such as long term, trans- and multidisciplinary, explorative, risky and conceptual research) required in a context of evolving paradigms and high demand for creative solutions.

Competences

A dynamic agricultural research sector largely relies on the competences and skills of the involved researchers. Most of the research institutions however work with a small permanent staff because of the restricted basic financing. This lack of critical mass makes it difficult to preserve and deepen the competences that have been built. The creation of competence pools that offer the necessary flexibility for experts to commute between research institutes can provide new opportunities to build a strong network of experts.

Organisation of research

In the past, there were already some actions to promote cooperation between research institutions, but additional efforts are needed. Collaboration should be encouraged through the creation of the correct conditions and by means of policy and financing. Research groups that go beyond the competitive, thematic logic of research can then for example be rewarded. This could also open possibilities to pool costly infrastructure and to stimulate multidisciplinary cooperation between Flemish complementary research teams and for the creation of consortia with Walloon and foreign research teams. The interaction and knowledge exchange between different research types (fundamental, applied, etc.) and application at practice level can moreover be promoted by the research in research chains and networks.

To realise these challenges and provide meta-coordination for the entire agricultural research sector, a new body should be created. It should search for synergies over the financing canals and research topics in order to achieve a maximum effectiveness of the deployed resources and expertise. This should preferable be realised through the installation of a forum in which both research institutions and financing institutions are represented.

Valorisation of research results

In recent years, a dichotomy has grown between knowledge production in open and closed knowledge bases. An increasing amount of private funding is often accompanied by a rising pressure to establish closed knowledge bases. This evolution however hampers the broader distribution of the obtained knowledge. As a consequence, the question arises to keep - especially - basic research as much as possible in open, rather accessible knowledge bases. Research characterized by an open knowledge base is on the other hand vulnerable to the leaking of intellectual capital. As a consequence, the researchers are often not appreciated for their work.
Efforts should thus be made to design of a fair regime of intellectual property rights, with attention for both the interests of the knowledge users and producers.

Conclusions

Agriculture is faced by continuous evolution, leading to an increasing competitive pressure, an increasing pressure to take the environment and climate into account and an increasing volatility of the market environment (which causes higher uncertainty for the farmers). Within this framework, this paper discussed the outcomes of a consultative process and investigated how agricultural research can contribute to the enforcement of the competitive power of the Flemish agricultural sector in 2020. The outcomes learn that action is needed on two fronts: the focus of knowledge production and the organisation of research.

There is a need for a focused knowledge production and five priority fields were identified for Flemish agricultural research: (i) genetics and biodiversity, aimed at an optimal exploitation of the genetic potential of plants, animals and micro-organisms and of biodiversity, (ii) optimisation of growth factors (plant, animals and soil processes) and production factors (such as capital, labour, knowledge and land), (iii) increasing performance and robustness of agro-food chains, (iv) raising the quality of agricultural products and valuation of the social role of food, and (v) broadening the value creation model of agriculture by developing a multifunctional agriculture. Within each of these fields, research should aim (i) to deepen the existing processes and competences in order realize an efficient production system, (ii) to broaden the model of value creation of agriculture and (iii) to contribute towards a more sustainable production.

As a second element, the organisation of research should be reconsidered so that four challenges can be addressed. A first element is an increased participation of relevant actors and organisations so that research networks can be established. Secondly, the research must be able to anticipate and to proactively address the occurring challenges and opportunities. A third element is the creation of a new body that provides meta-coordination on issues like financing, cooperation and competences and finally, new strategies should be developed to valorise research results and to transcend the duality between open and closed knowledge bases.

These findings were summarized in a White Paper on Agricultural Research, but this doesn't guarantee that the (theoretical) findings are implemented in the field. Continuous efforts should be made, by the researchers, the government and the agricultural sector, to tackle the issues. The first efforts have now been made. The Platform for Agricultural Research has agreed to take the White Paper as a lead in the design of its future activities and the largest Flemish farmers' organisation agreed to invest an additional 3 million Euro in applied research activities (VILT, 2009).

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THE GROWING IMPORTANCE OF ACTIVITIES DIVERSIFICATION FOR ENHANCING FAMILY FARMS COMPETITIVENESS

Sasa Todorovic[1], Mihajlo Muncan[2], Marina Miljkovic[3]

Abstract

Family farms are the most significant development entities of rural areas. The welfare of the rural population depends on the success of their business operations and ability to survive in the market. Bearing this in mind, it is necessary to find ways and create the adequate conditions to activate development potentials.

The objective of this study is therefore to systematize potential sources of farm households' income, with special emphasis on how and why they diversify their income and activities.

Results of the research unambiguously show that diversification of income and activities are now integral part of business activities of numerous farms. No doubt, importance of diversification will increase in future period, considering that more dynamic development of farms is not possible without engagement of all potentials at their disposal.

Key words: diversification, competitiveness, family farms.

Introduction

A powerful incentive to revitalize the rural areas and implement the modern concept of rural development comes from the process of joining the EU. This problem was neglected for many years, regardless the importance on the overall development of the Republic of Serbia. As stated by Bogdanov Natalija and Stojanovic Zaklina (2006) it was not before 2005, when considerable efforts have been made in the direction of institutionalization and establishment of integral state policy in this field, although regional aspects of the agricultural production and heterogeneous aspect of rural area have always been emphasized in strategic documents and plans which related to development of agriculture. The consequence of long-term developmental degradation of rural areas is significantly lagging in structural adjustment to European solutions and practice. With regard to the diversity of developmental potentials access to its activation can not be uniform. Therefore, there is no doubt that the planning and implementation of rural development will be complex and lengthy process that will require cooperation and partnership of public, civil and business sector at the local, national and regional level.

In this regard, special attention has to be paid to family farms, as the most significant development entities of rural areas. The welfare of the rural population depends on the success of their business operations and ability to survive in the market. Although they still exist on market, many of them will not be able to transform to the commercial farms. Therefore, special attention must be focused on finding ways for improvement of their position. As stated by Todorovic et al. (2008), it is apparent that significant resource reserves are present on the family farms, and these resources have not been sufficiently utilized. Bearing this in mind, it is necessary to find ways and create the adequate

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conditions to activate development potentials. In this way family farms will become competitive, their business profitable and living conditions of households will be better. Such farms will be able to invest in new knowledge, innovation, modern technology, equipment and marketing and successfully deal with the globalization of world economy.

The objective of this study is therefore to systematize potential sources of farm households' income, with special emphasis on how and why they diversify their income and activities.

Material and method of the study

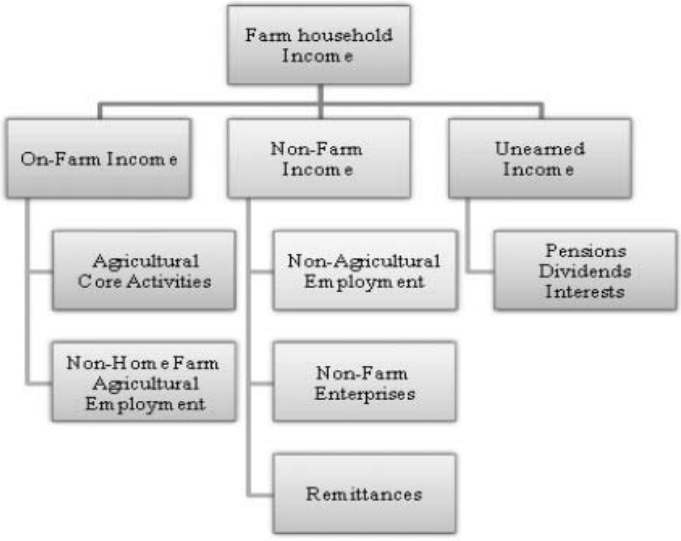
For the purpose of this research, besides collected information on registered agricultural households on the territory of AP of Vojvodina, also research results obtained by other authors were used, in order to perceive the investigated problems to the fullest. Main limitation of this and similar researches, as stated by Bogdanov Natalija et al. (2008) is absence of universally defined indicators and parameters, which would describe certain indicators related to interpretation of the condition in rural areas, communities (absence of statistical definition of rural areas, insufficient typology of rural households, especially households with farm, etc.). These limitations derive from complexity of problems of rural development, national/local specificities, statistical-methodological inconsistencies, etc.

Results and discussion

Carried out research unambiguously confirms that diversification of income generated on family farms is more rule than exception: almost all observed farms generate income from multiple sources. This is a consequence of the fact that farm owners, in conditions when they are facing difficulties in agricultural sector and permanent decrease of income, start to search for new ways to increase income, and one of the ways is engagement in activities which would supplement or replace income generated in agriculture.

For more complete perception of this occurrence, it is necessary to systemize potential sources of income on family farms (Figure 1):

Figure 1 - Potential Sources of Farm Household Income

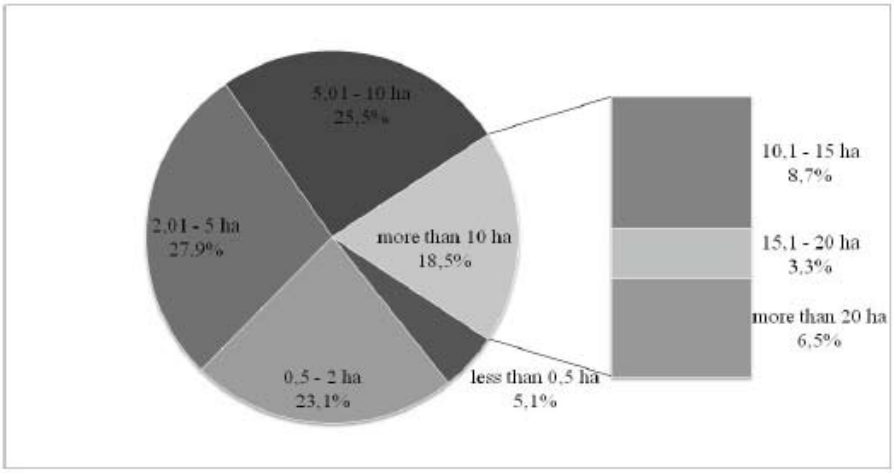


Source: Davis and Pearce (2000)

The largest number of Serbian family farms has more sources of income, income outside agriculture, income from sale of agricultural products, as well as retirement pensions. However, the significance of different sources of income is not the same for family farms, and varies according to region and production direction.

Considering that research included family farms located in low land region, one of major determinants of their income is size of used area, and this imposes the problem of unfavourable ownership structure (Graph 1).

Graph 1 - Ownership structure of registered agricultural households on the territory of AP of Vojvodina in year 2008.



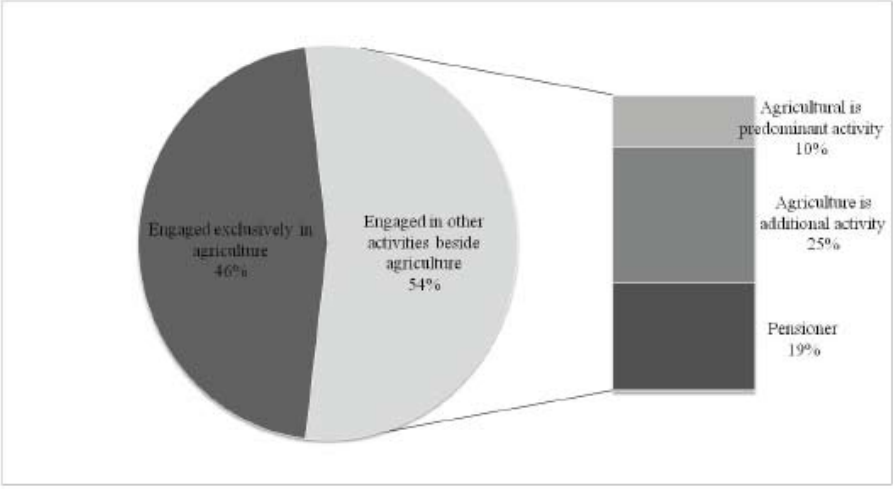
Source: Author's calculation based on data from Ministry of Finance of Republic of Serbia - Treasury (06.05.2008.)

In the structure of registered agricultural households on the territory of AP of Vojvodina in observed period, small farms are predominant – farms with land property bellow 5 ha make 56% of total number of registered farms, whereas the share of farms with land property of over 10 ha is 18,5%. This is extremely unfavourable ownership structure considering that these are farms located in low land region. Unfavourable ownership structure is general problem present at the level of Republic of Serbia. According to research results obtained by Bogdanov Natalija and Bozic Dragica (2005) in ownership structure of farms in the Republic of Serbia, predominant are small farms, since small farms with bellow 3 ha of land make 60,2%, whereas farms with over 10 ha make only 5,6% of total number of farms[4]. Considering the decisive significance of ownership structure for efficiency of operation in agriculture, it can be concluded that it is very difficult to remain competitive and survive on the market with conditions of increasingly stronger competition with such unfavourable ownership structure.

It is clear why family farms generate significant part of income from off-farm sources. As illustration of this occurrence is data on labour engagement of owners of registered agricultural households on the territory of AP of Vojvodina (Graph 2).

4 According to Census 2002, number of agricultural farms in Republic of Serbia was 778.891.

Graph 2 - Work activity[5] of owners of registered agricultural households on the territory of AP of Vojvodina in year 2008.



Source: Author's calculation based on data from Ministry of Finance of Republic of Serbia - Treasury (06.05.2008.)

Analysis of registered agricultural households in regard to work activity of the farm owners shows that in the observed period in AP of Vojvodina, most of farm owners (54%) were engaged in other activities, beside agriculture. Also, the highest share of farm owners engaged in other activities beside agriculture was the highest in case of small farms, as a rule.

According to Ellis (1993), diversification of income is a model for which family farms decide when their main motive is to increase i.e. maximize profit. Such farms determine, as their development strategy, maximum employment of family members (daily wages, over time engagement, production specialization or production diversification – depending on the resource at their disposal). Through diversification of income, some of the farms manage to accumulate capital (saved money, acquired knowledge and skills, physical capital, realized social and business contacts) which enables them to carry out higher diversification phase – diversification of activities.

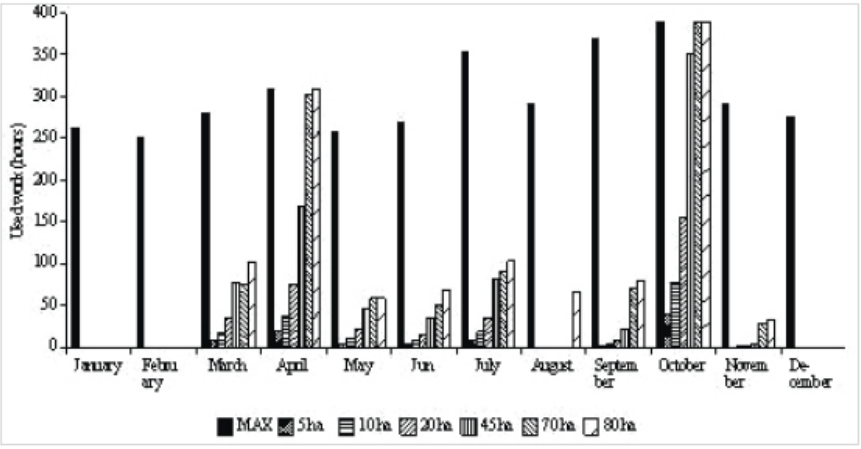
However, in order for diversification of activities to be carried out, it is necessary to fulfil at least two requirements: existing opportunity on one side and time at disposal on the other. Role of the owner of family farm is to recognize new development possibilities as they occur and find the way to best utilize them. In this way, prerequisites are created for improvement of competitiveness of the farm. Issue of time at disposal is related to farm size and nature of production. If time at disposal and farm size are taken into consideration, it becomes apparent that possibility to engage in other activities decreases with the increase of the farm size. Majority of family members which are active off the farm are from small farms, and with the increase of the farm size number of family members with off farm activities decreases. Beside the farm size, time at disposal also depends on the nature of production, which is only partially reflected in the farm size. Some productions are more labour intensive than others, some require daily engagement, whereas others have seasonal

5 Work activity of owners of agricultural farms can be: **engaged exclusively in agriculture**, **agricultural is predominant activity** (more than 50% of time), **agriculture is additional activity** (less than 50% of time) and **pensioner** (in case of lack of formal status of pensioner, persons older than 65 years of age are categorized in this category).

character. Therefore, observed farms were categorized according to criteria of production direction. In this way three major types of farms were identified: farms of field crop direction, vegetable-field crop direction and livestock direction. It was established that production direction greatly influences the amount of time remaining for engagement in other additional activities throughout the year. Therefore, it is not surprising that on farms specialized in production of milk or vegetables, it is significantly harder to be engaged in additional activities compared to farms specialized in field crop production.

In the analysis of time distribution and labour dynamics according to months of the year, Muncan et al. (2008) came to conclusion that on family farms included in the research, labour peaks were in April and October, considering that these are the months of intensive field crop activities, and only in case of farms of over 45 ha, for October, and over 70 ha for April (Graph 3).

Graph 3 - Labour dynamics according to months of the year at farms of field crop direction



Also, it is obvious that there is time at disposal for other activities on these farms, which, as already stated, is one of the main conditions for diversification of activities. With the increase of farm size, also the number of active family members who are working full time on the farm increases, and number of family members who are actively employed off their own farm is decreasing. This fact induces a conclusion that the biggest farms have deficit of labour, whereas small farms are not able to employ fully all active members on the farm, and some of them are forced to find jobs and work off the farm i.e. search for additional sources of income generated by work off their own farm. Engagement of unused labour for some additional activities has very favourable impact on total income generated by the farm. Considering that to be competitive, among other things, means to efficiently utilize own resources, in this way the competitiveness of family farms is increasing. Money income generated off the farm is the highest in small farms and is very important for their survival, whereas with the increase of the farm size, the amount of income generated off the farm decreases as well as its significance.

Conclusion

In conditions of constant growth and increase of competition on domestic and World market, identification and analysis of specific development limitations of family farms and objective perception of their needs and development potentials, should contribute to creation of new, valid mechanisms and strategies for starting of the process of improvement of their performances. More dynamic development of family farms is not possible without engagement of all potentials at their disposal, which is why the importance of diversification will increase. One thing is certain, it is currently integral part of business activities of numerous farms. Creation of space for engagement in other activities, along with engagement in agriculture, will in future period ensure competitive advantage for family farms in the region. Beside that, favourable influence of income generated from off-farm sources on improvement of general position of family farms confirms that „part time" farms are more competitive in relation to other farms. This conclusion speaks in favour of general thesis that „part time" farms are those with better standard of living, better educational and age structure of family members in relation to other types of farms and can be considered as carriers of the progress, technical-technological and other innovations in rural communities.

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MARKETING RESEARCH ABOUT PERCEPTIONS OF PRODUCERS OF ROMANIAN TRADITIONAL PRODUCTS

Raluca Ion Andreea[1], Magdalena Turek[2], Adrian Turek[3]

Abstract

The purpose of this study is to describe the businesses of Romanian producers of agro-food traditional products traded to the Romanian Farmer's Fair. The need of pursuing these issues is emerged from the changes happened on the market of agro-food products in those regarding the transitions to a healthier consumption, to ecological and/or traditional products, in the case of some consumers. Because of these, some producers identified opportunities of developing businesses with traditional Romanian products.

In describing producers' businesses, a qualitative marketing research is undertaken to the Romanian Farmer's Fair, trying to identify future trends of the market of agro-food products.

Key words: traditional products, model of consumption, agro-food products' market, consumer

Introduction

The purpose of this study is to describe businesses of farmers who trade their agro-food traditional products to the Romanian Farmer's Fair. The need of this research consists of changes on agro-food products market, related to consumption pattern changes from conventional ones towards traditional and/or organic ones, in the case of some categories of consumers. Because of these changes, producers of traditional products have opportunities for relaunching production.

Traditional products take an important place in European Union countries' agribusiness systems, being protected and promoted by law. To Community level, the market of agro-food traditional products is regulated by RC no. 509/2006 of the Council of March, 20th, 2006 regarding special traditional guaranteed agricultural and food products. In article 2 of the regulation, terms of specificity, traditional and traditional specificity are defined.

Specificity is a characteristic through which an agricultural or food product may be distinguished clearly from other similar agricultural or food products, belonging to the same category. Traditional products are those products for which it's producing and trading on community market have been transmitted from generation to generation, and this fact can be proved. The period considered is at least twenty five years. Traditional guaranteed specificity has been recognised by the Community by its registration in conformity with the quoted regulation.

To national level, in Romanian legislation the market of traditional products is regulated through Government Decision no. 134 of February 6th 2008 regarding agro-food products guaranteed

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traditional specifications. The law defines the terms and establishes the authorities responsible with documents' control submitted for obtaining protection of a traditional guaranteed specification for an agricultural or food product. It also verifies the labelling and using the national or community logo which makes differences among products on the market, obtained in industrial systems.

Because of their important place on the agro-food market, traditional products' producing, trading and consumption are encouraged through the Program „Romanian Farmer's fair". This is a project of the group "Radu Anton Roman" and Association „Friends of Romanian Farmer's Museum", DC Communication, Cultural Association Macondo, Fundation ADEPT and media partners. This fair has been organised since October 2008 and continues in present, in different locations in Bucharest, on Saturday and Sunday.

The present study describes the businesses of producers of traditional agro-food products, sold to the Romanian Farmer's Fair, trying to identify premises for designing the future trends of the market of these products.

Research objectives and relevance

The objectives of this peace of research describing the businesses of producers of traditional products traded to the Romanian Farmer's Trade are:

1. Identifying groups of producers of traditional products on regions of origin, types of products and type of businesses;
2. Identifying the fact whether producers belong or not, or they intend to belong to associations of producers;
3. Identifying producers' experience in obtaining traditional products;
4. Identifying types of Romanian traditional products obtained and traded by producers from different areas;
5. Identifying the frequency of producers' participation to this fair;
6. Identifying the average quantity of products purchased to the fair, on types of products;
7. Identifying the ingredients and recepies used for obtaining traditional products;
8. Listing the prices of traditional products, on types of products;
9. Identifying producers' perceptions related to the place of trading traditional products;
10. Identifying producers' perceptions related to the utility of this fair;
11. Identifying producers' interests to participating to other event related to traditional products;
12. Identifying trends of obtaining and trading traditional products;
13. Identifying opportunities for developing businesses with traditional products.

The relevance of the research consists of changes on agro-food products' market. The results of the study may contribute to identifying the regions with potential and vocation to obtaining traditional brands, which may be launched on the market. It also may contribute to increase efficiency in taking advantages of the local resources.

Research questions

The questions of the marketing research related to describing the businesses of producers of traditional products traded to the Romanian Farmer's Fair are:

1. How are producers of traditional products organised in regions, types of products and types of businesses?
2. Which are the regions of origin of traditional products traded to the Romanian Farmer's Trade?
3. What is the experience of the producers in obtaining traditional products? Which are the other ways of trading traditional products?
4. What kind of traditional products are traded to the Romanian Farmer's Fair?
5. Which are the recepeices used by producers in obtaining traditional products?
6. Which is the frequency of producers' participation to this fair and the average quantity of products purchased to the fair, on types of products?
7. Which are the prices of traditional products?
8. Is the fair an opportunity to develop businesses with traditional products?
9. Which are the trends in obtaining and trading traditional products?
10. Are there any opportunities for developing businesses with traditional products?

Research methodology

A piece of marketing research has been undertaken for describing the businesses of producers of traditional products traded to the Romanian Farmer's Fair, using qualitative methods. For collecting the data, the technique of semi-structured interviewed has been used, with a quid of discussion. The respondents have been selected among the participants of the fair. They are producers of traditional products coming from Muntenia, Moldavia and Transylvania. They are between 23 and 50 years, both men and women, married, with 2-8 members in the family.

For analysing the data, critical thinking methods have been used: argument analysis, explanation, evaluation, and inference. The results of the research were validated using the method of negative case analysis (Miles and Huberman, 1994). Counter-evidence is present in the processes of analysing the data and elaborating conclusions (Bardi, 2003).

Data analysis

Farmers come from different regions of Romania: Fundata – Bran, Făgăraş, Criţ, Bucovina, Moldoviţa, Botoşani, Maramureş, Argeş, and Bihor: Tulca, Târnava Mare, and Sighişoara. They are organised as individuals or as companies. Individual producers are from Fundata, Bucovina, Crit, Arges and they work with their families of 2-4 members. Farmers from Botosani, Bucovina and Maramurea are organised in companies of 5-9 employees. Some producers are members in different farmers' associations.

The products made and traded to the fair may vary from one area to another (table 1). Sausages, cheese and meat products are made in Fundata, Bran and Fagaras. Fruits and vegetables products, fish and pastries are made in Bucovina and Botosani. Meat products are made in

Maramures, and jams, bread and teas are made in Sighisoara. Strong alcoholic beverages are made in Arges and Bihor.

Table 1 - Products traded to the Romanian Farmer's Fair and their area of origin

No.	Area of origin	Types of products traded to the fair
1	Fundata – Bran	Sausages, cheese fume, and other specialities of cheese
2	Fundata – Bran	Specialities of sheep cheese
3	Fagaras	Meat products
4	Bucovina	Bakeries, jams, vegetables' products
5	Bucovina	Butter, fish special prepared, cheese fume, traditional cakes with cheese
6	Bucovina – Moldovita	Syrups, jams
7	Botosani	Traditional meat products
8	Bucovina	Traditional meat products
9	Maramures	Traditional meat products
10	Tarnava – Mare	Jams, dries fruits, saucer conserved vegetables, bread
11	Sighisoara	Jams, bread, tea
12	Crit – Brasov	Goat milk products
13	Crit – Brasov	Jams, bread, vegetables' products
14	Arges	Strong alcoholic beverage made of plums
15	Comuna Tulca – Bihor	Strong alcoholic beverage made of fruits

Asked about „What is the quantity of traditional products sold per year?" producers were not able to answer, because they do not keep accountancy, just some of them answered with approximation.

In Table 2 is presented the situation regarding the answers to the question „What number of animals do you exploit for obtaining traditional products?" It can be noticed that the farmer from Fundata-Bran, who produces sausages, cheese fume, and other specialities of cheese exploits 500 sheep and 50 cows. The farmer from Fundata-Bran, who produces specialities of sheep cheese, exploits 400 sheep. The producer of meat products from Fagaras slaughters 10 pigs and 3 veal per week and so on.

Table 2 - The quantities of products obtained, livestock, area of origin and type of products traded to the Romanian Farmer's fair

No.	Area of origin	Types of products traded to the fair	Quantities produced	Livestock
1	Fundata – Bran	Sausages, cheese fume, and other specialities of cheese	-	500 sheep, 50 cows
2	Fundata – Bran	Specialities of sheep cheese	-	400 sheep
3	Fagaras	Meat products	-	10 pigs and 3 veal per week

No.	Area of origin	Types of products traded to the fair	Quantities produced	Livestock
4	Bucovina	Bakeries, jams, vegetables' products	Vegetables' products – 500 jars, bakeries – 1000 kg, jams 1000 jars	No livestock
5	Bucovina	Butter, fish special prepared, cheese fume, traditional cakes with cheese	1000 fishes, 2000 butter pieces, 300 cheese pieces	5 cows
6	Bucovina – Moldovita	Syrups, jams	-	-
7	Botosani	Traditional meat products	-	5 cows, 8 pigs, 7 veals per week
8	Bucovina	Traditional meat products	-	15 cows, 18 veals, 2 pigs per week
9	Maramures	Traditional meat products	-	3 cows, 6 veals, 5 pigs per week
10	Tarnava – Mare	Jams, dries fruits, saucer conserved vegetables, bread	-	-
11	Sighisoara	Jams, bread, tea	-	-
12	Crit – Brasov	Goat milk products	-	100 goats
13	Crit – Brasov	Jams, bread, vegetables' products	-	-
14	Arges	Strong alcoholic beverage made of plums	-	-
15	Comuna Tulca – Bihor	Strong alcoholic beverage made of fruits	300 litres	No livestock

Because of the lack of data regarding the quantities of products obtained, it comes difficult to draw conclusions related to the economical efficiency of producing traditional products. It can be said that producers do not belong to the category of small producers, their businesses having high dimensions, taking into account the number of animals and hectares they exploit.

To the question „Which is the system of breeding the animals?" all farmers answered that the system is the extensive one. This premise goes to the conclusion that products made might be considered natural and producers may obtain ecological certificates for them.

In those regarding the experience of producers in obtaining and trading traditional products, this varies between one and 10 years. Still, there are producers considering that they make these products for 100 years: „we rose with them and now we keep on going family traditions". On average, the producers' experience is 4.5 years.

Some producers come to the fair weekly – producers from Fundata, Bucovina, Crit and Arges, and the others twice or once per month.
To the question „What ingredients do you use for obtaining traditional products?", all producers answered that they use traditional recepeices and natural ingredients: „natural ingredients and recepies coming from my parents", „traditional recepies coming from my parents and natural ingredients, without additives or chemicals", „Romanian traditional recepies" etc. Among the ingredients mentioned by producers are: milk, salt, sheep and veal meat, pepper, garlic etc.

There are not enough data regarding the prices of traditional products, just for fishes – 65 lei/kg (15 euro), vegetables' specialities – 15 lei/jar (3,6 euro), jam – 10 lei/jar (2,4 euro), syrup – 10 lei/jar (2,4 euro), strong alcoholic beverage – 50 lei/litre (12 euro). It must be mentioned that the same products obtained in industrial system have lower prices. The prices' gap is justified by the high quality of traditional products, compared to industrial ones, natural ingredients and special taste.

Producers who come to this event consider the fair as being welcome for small producers, because it helped them to promote their products and the area they come from. It is well organised, civilised, with a friendly environment: „It is a good idea, welcome for small producers who used to stay days in Brasov markets and sell nothing". „Very well organised and useful for small producers", „A friendly environment" etc.

Producers who come to Romanian Farmer's fair consider this event very useful, because it represents an opportunity to keep and promote Romanian food tradition from areas where producers come from. It helps them to sell their products and it promotes consumption of natural food and Romanian traditional food taste:"It promotes both our products and the local tradition of areas we come from","It is useful because it enables us to gain money and to promote our area", „Without this fair, our last chance to keep tradition alive dies". Producers consider that, compared to other fairs, this one promotes the area the producers are coming from.

Some producers have been participated to other events related to traditional products: in Italy, to an event organized through the project Romanian Farmer's Fair and Village Museum.

To the question „What measures do you consider as being necessary for developing businesses of traditional products?" producers answered that the state, authorities and other organisations, associations and foundations must imply themselves in this process. Another identified need consists in organizing more fairs of this kind.

Conclusions of the research

Producers of traditional products consider this fair welcome for small producers, because it helped them to promote their products and areas, it is well organized, civilised, having a friendly environment.

Producers consider useful this fair because it represents an opportunity to keep and promote Romanian traditional food from areas they come from. It also enables them to gain money from selling their products and it promotes consumption of natural products and the taste of Romanian food. Producers consider that, compared to other fairs, this one promotes the area the producers are coming from.

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Parallel Workshop Session C

ROLE OF INNOVATIONS AND KNOWLEDGE -
INFRASTRUCTURE AND INSTITUTIONS

BRIDGING THE GAP BETWEEN FARMERS AND CONSUMERS: VALUE CREATION AND MEDIATION IN "PASTURE-RAISED BEEF" FOOD NETWORKS

Florence Bedoin[1], Troels Kristensen, Egon Noe

Abstract

The aim of this article is to explore how different quality dimensions (safety, aesthetics, ethics and rooted ness) are created in food networks; how these qualities are transferred until the consumers; and how this process is supported by the organisation of the food network.

Our postulate is that combining the quality and organisation dimensions and exploring the link between them will provide an interesting perspective for improving the sharing of values in food networks.

This framework is applied to five case studies of "pasture-raised beef" food networks in France, representing a diversity of organisations such as public label scheme, cooperate owned brand and direct sell from farmer to consumer. The results highlight the importance of the role of certification and personal commitment for the creation, and also for the mediation of added-value.

Key words: Grassland, meat quality, sustainability, food labeling, case study

Introduction

Recently there has been a wealth of papers reviewing the emergence of "alternative" food networks and their diverse ways of attempting to reconfigure relationships between food producers and food consumers (Marsden et al. 2000; Sage 2003). Furthermore, short food chains, environmentally friendly production and consumption systems and other "alternative" food networks are seen as potentially more sustainable than the "mainstream" ones because of their focus on "quality", "place" and "nature" (Goodman 2003). In their paper from 2006, Laura Venn et al. reported that they had found 56 published articles in the area of "alternative food networks" that included140 empirical case studies (Venn et al. 2006). From this abundant literature emerge several questions that invite further research. Some of them relate to value communication and dialogue in food chains: for example: "At the same time, researchers should aim to analyse the process of meaning creation in food production, consumption and marketing, also evaluating how operations vary with changes in meaning" (Brunori et al. 2008); "methods for improved communication and sharing of values in global and long-distance food chains on the basis of negotiation between equal partners [should be investigated]" (Niggli et al. 2008).

In this paper we will explore the link between the organisation of the food network and the quality construction and mediation within the food network. This exploration is here done in the context of the beef market, and especially the identified "pasture-raised beef", where the meat comes from cattle that have been grazing, at least part of their life.

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In comparison to "mainstream" meat, which comes from young bulls fattened indoors or culled dairy cows, "pasture beef" farmers can claim that their production systems have some added-values concerning animal welfare, rural landscape, environmental impact, meat flavour, and healthiness of the meat, depending on the characteristics of the farm and transformation practices. Meat-based food networks are characterised by the segmentation of the products that each actor works with: animal, carcass, muscle or meat cut. Each of these steps has its own features and its quality is appreciated in different ways. The quality of the final product depends on all of them. Our hypothesis is that it is an organisational challenge to link the qualities of each stage and for this to be reflected in the quality of the final product.

Methodology and theoretical framework

This study is based on a multiple case study analysis. We use a case study analysis because we think that we can learn from the diversity of food networks. A case study is a good tool for learning from real-life phenomena. (Yin 2003; Stake 2000)

The idea is not to directly compare the cases but to gather a diversity of the strategies in this context – investigating how particular organizations allow (or not) farmers to reveal and communicate the quality of their practices and of their products.

Case selection

Our criteria for selecting the food networks were:

- Diversity of distributors (butchers, restaurants, supermarket, catering, direct to consumer)
- With or without certification scheme
- Farmers owning or not the means of transformation (i.e. meat transformation plant)
- Collective or individual initiative

The case studies were not intended to be representatives of different types of food networks, but to illustrate the heterogeneity of the approaches encountered during the initial exploration. The selected cases claim a "special" quality of their products relating it, more or less explicitly, to grazing practices.

We concentrated our study in the centre of France and especially in the Allier department and neighboring areas. This region has the oldest Label Rouge certified beef food network and an important diversity of other food networks. In our search for more diversity we also chose two other food networks located in neighboring areas.

Data collection and processing

Information for the case studies was obtained in three main ways:

- Qualitative open-ended interviews of 22 stakeholders to gather an in-depth account of their experiences, conducted in February and March 2009. We asked questions about production, process, procurement and marketing practices, certification and regulations, communication and coordination among the actors. We did not interview consumers, but we interviewed actors in the chain who are in direct contact with consumers and we asked them about their perception of consumer demand. The interviews were conducted by the first author and, with three exceptions, were taped and transcribed.

- Analysis of documents

We gathered relevant documents from the organizations, especially documents for communication with customers, prices and services

- Observations

While doing the interviews we visited the firms and farms and developed the questions according to observations.

Those multiple sources of information were triangulated to reduce the likelihood of misinterpretation. Triangulation is usually used by qualitative caseworkers and is generally considered as "a process of using multiple perception to clarify meaning (…)"(Stake 2000).

The challenge of quality definition

Quality of meat includes both (1) the objective dimensions i.e. traits that can be measured on the samples and is dependant on the biological basis, but independent on the user this includes microbiological measurements, as well as colour and tenderness of the meat, and (2) the subjective dimension, based on the perceptions of the users i.e. their preferences, in terms of the value they attribute to various type of information (Edwards and Casabianca 1997). this includes consumer perceptions of the method by which the meat was produced and its perception of the flavour.

We had established a typology of the different quality dimensions based on literature (Brunori 2007; Niggli *et al.* 2008; Conner *et al.* 2008; Edwards and Casabianca 1997; Morris and Young 2000) that can be embedded in a beef meat product in a consumer perspective. These ranged from objective to subjective dimensions:

- Safety (sanitary quality, freshness)
- Health (presence of healthy micro-nutrients, fat)
- Aesthetics (flavour, juiciness, tenderness)
- Ethics (animal welfare, pollution, landscape, supporting family farming)
- Rooted ness (connection to traditions, culture, the food is produced by someone, somewhere)

This framework has been used for analysing quality creation and mediation in the case studies.

Brief presentation of the cases

Case A: Label Rouge Charolais du Bourbonnais

About 130 farmers own a cooperative slaughterhouse and meat-processing plant. They supply mainly butchers, but also restaurants. The beef is sold under a Label Rouge, which is the name of a collective mark owned by the French Ministry of Agriculture. The Label Rouge guarantees a superior quality of the final product in terms of flavor in comparison to standard meat. They also got the European PGI (Protected Geographical Indication) label which is the European mark for foods that are authentically linked to the area where they are produced.

Case B: Supermarket Label

This is a certification scheme initiated by one of the biggest French supermarket chains in 1996. They work together with farmers' cooperatives in different French regions. They require a "traditional" way of production with several months of pasture for the animals. The production and process requirements are controlled by an independent control firm.

Case C: Nature park certification

This is a cooperative of 42 farmers producing Salers beef in a mountainous area of the Massif Central. They have their own meat processing facilities, employ a butcher and sell their vacuum packed products to restaurants and private households. They use the regional nature park trademark. This means that farmers have to comply with requirements for environmental and landscape friendly production systems. The region is touristy, with typical landscapes.

Case D: Farmers' collective shop

This is a farmers' shop which opened in 2002. Ten farmers of the region sell their products in the form of vegetables, wine, cheese, meat, etc. The farmers commit to be themselves present at the shop. One of the farmers has beef cattle on grass and employs a butcher for the carving. The shop sells around an equivalent of half a beef carcass per month.

Case E: Farm box scheme

This is an 110-ha farm with suckler cows of the Charolais breed. The animals are slaughtered at a slaughterhouse and the carcasses are then sent to a meat processing plant where they are cut and packed. The meat is delivered by the farmer to private households in big cities and in his region.

Results and discussion

What is quality to the consumers? Perceptions of the other food network actors.

Asking the actors about their perception of consumer requirements, we got the following results: tenderness is the most frequent requirement of consumers; sanitary safety is often taken as given; but, following the BSE crisis, there are still preoccupations with what the cattle have been fed. Concerning flavor, there is a broad diversity of consumer preferences; some prefer a strong taste while others prefer a mild one, but it is an important feature for all. Regarding production conditions the fact that the animals can go outside is considered as very positive. Some consumers also look for a direct contact with the farm or the farmer and also for a product "story" that they can relate to.

Of the five quality dimensions defined in the Methodology section, the healthiness of the product (micronutrients and fat content) was the only dimension never mentioned by the interviewees.

How do qualities emerge from the practices and conventions of the food network? (Figure 1)

In terms of quality creation, we can observe that there is a large diversity between the five cases:

The Label Rouge CB, focuses the efforts of the actors on aesthetical aspects, involving farmers and meat processing practices, especially a long dry aging on bones.

The supermarket label focuses on farm practices. The meat processing practices, aging and carving, don't give any added-value because they are similar to the mainstream meat production.

For the nature park label, the certification focuses on the regional identity and environmental considerations. However the practices responsible for flavour, which have emerged from the negotiation between the partners, make it an important feature of this food network.

Figure 1 - Practices for adding value to the product and actors involved in the creation of these values

		Label Rouge CB	Super-market Label	Nature park label	Farmers' shop	Farmer Box scheme	Who is involved?
Safety							
Traceability		*RR*	*RR*	RR	RR	RR	All
Microbiological		*RR*	*RR*	RR	RR	RR	All
Long-term potential effect on health or environment	Limited list of allowed/ forbidden feedstuffs Limited medicine intake of the animals GMO in the feedstuff	*RR++* *RR+* discussed	*RR+* *RR+* nm.	*RR* *RR* *Forbidden*	RR RR Not using	RR RR Not using	Farmers Farmers Farmers
Aesthetics							
Tenderness:	Maximum age of the animal Reduced stress of animal Minimum aging on bone Butcher adapting to the diversity for cutting	*96 months* *Yes* *10 days* Yes	*144 months* *Yes* *7 days* Yes	120 months nm. Adapting Yes	70 months nm. Adapting Yes	? Young nm. 14 days Yes	Farmers Farmers + transport Abattoir /meat processing. Distributors
Flavor, juiciness, no cooking loss	Breed Minimum age of the animal Pasture based alimentation Aging of the carcass on bone Providing cooking advice to the consumers	*Charolais* *28 months* *Yes* *Yes* Yes	*Charolais* *28 months* *Yes* No nm.	*Salers* 26 months *Yes* Yes Yes	Limousine 16 months Yes Yes Yes	Charolais 16 months Yes Yes Yes	Farmers Farmers Farmers Abattoir/ meat processing Distributors
Color	Selection of carcass by color	*Yes*	No	No	No	No	Abattoir/ meat processing

Italics: indicates that the feature is mandatory in the food network (certification) nm: Not mentioned

RR : Respect official Rules and legislation + : further rule, added to the requirements of the certification scheme

		Label Rouge CB	Super-market Label	Nature park label	Farmers' shop	Farmer Box scheme	Who is involved?
Ethics							
Animal welfare		*RR*++	*RR*++	*RR*++	RR+	RR+	Farmers + transport
Limit negative environmental impact	Limit polluting emissions Respect biodiversity Recycling	RR	RR	*RR*++ ++++ +	RR	RR	Farmers Farmers Farmers
Care of landscape		Care hedges	nm	+++	nm	Care hedges	Farmers
Rootedness							
Regional identity	Region of production identified Region of process identified Local consumption	*Yes* *Yes* No	No No No	*Yes* *Yes* Partly	*Yes* *Yes* *Yes*	Yes Yes Partly	All
"Traditional" practices	Reference to the history of the farming activity and handicraft	Yes	Few	Yes	Yes	Yes	All

Italics: indicates that the feature is mandatory in the food network (certification) nm: Not mentioned

RR : Respect official Rules and legislation + : further rule, added to the requirements of the certification scheme

The two food networks working with direct sale between farmer and consumer are mainly selling young bulls of age 16 to 24 months, which are supposed to give a milder taste but very tender product.

It is also interesting to note that at the beginning of four of these food networks (excluding the nature park label) you can almost have the same animal, from the same farm. At the end you can end up with very different product attributes because of the processing practices and the organisation of the food network.

A farmer delivering animals to case B, case E and to a food network similar to case A (fcE):

"For me they [my animals] *don't have a different quality: the animals are from the same group, have been fed in the same way, with the same feedstuff and have more or less the same shape. I think the quality of the meat in relation to tenderness and flavour is achieved by the aging on bones. That is the critics I make towards one of these food chains…"*

Most of the quality dimensions identified - safety, aesthetics, and rooted ness - implicate several actors of the food network, from farm to distributor. Each quality can only be realised if all actors contribute to it. This coordination for the creation of quality is realised through a negotiation between the actors, for example, about the method chosen for aging the meat. The result of the

negotiation is either formalised by a certification or just part of a business relationship based on stability and trust.

Ethical qualities such as animal welfare and limited environmental impact were only related to farm practices and did not involve the other actors. They were in general not considered important qualities to develop compared to aesthetical or rooted ness qualities, although, some farmers would like to transfer these qualities to the consumer.

Transmission of the values embedded at farm level along the chain and to consumers

In the five food networks presented here, we found that the values embedded at farm level are transmitted to the consumers in two main ways (Figure 2):

- a direct farmer-consumer contact where there is a possible discussion between farmers and consumers
- through posters showing some aspects of the farm/animals. This communication is allowed by the certification. It does not need the involvement of the meat processing/sales actors.

Communication by other actors, like restaurants and butchers rarely takes place. We found two reasons for that:

- they communicate mainly about their work, the choice of the pieces, and the preparation for the restaurants.
- in general there is a lack of knowledge of butcher and chefs about what is happening on the farm

Butcher (b1cA): "*What I want is that farmers raise their animals as they want. What I want is to have good merchandise.* (…) *How farmers raise their animals, what the animals eat, I don't know…*"

In the "nature park label" food network, restaurants' chefs sometimes talk about the animals and the farms because there is a real demand from the tourists, but it seems that it remains a cliché rather than information:

Cook (r2cC): "[When the clients ask] I say: *it comes from animals like this beautiful cow; we have a nice picture, there*"

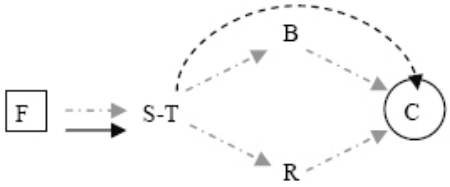
This lack of knowledge/interest has been identified in the Label Rouge CB case, and the farmers' cooperative is about to organize farm visits for the butchers.

The importance of the type of distributors

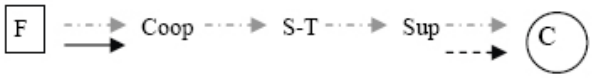
From the four selection criteria, the variety of the distributors turned out to be very important in the choice and transfer of quality:

- Butchers and restaurants focus on the flavor and tenderness for their consumers and lack knowledge about farms and animals production.
- Direct farmers/consumers sales enable a communication by the farmer about the conditions of production on farm and the locality.
- In the supermarket case we observed an efficient communication about farm practices through certification. But in comparison to the other food networks, the more "industrial" processing practices don't convey as much added-value.

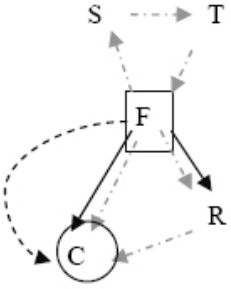
Figure 2 - Sharing of knowledge about the specificity of farm practices and their potential added-values



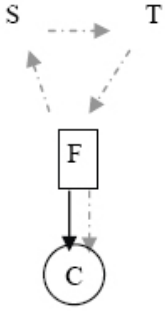
Label Rouge CB



Supermarket Label



Nature park label



Farmers'shop
Box scheme

Product flow
Sharing of knowledge about the specificity of farming practices and their potential added-values through direct contact
Sharing of knowledge about the specificity of farming practices and their potential added-values with posters and advertising material through certification

Concluding remarks

Because some of the values are created by a contribution of several actors of the food network (such as the aesthetical ones), creation and mediation of these values are closely linked. Institutionally-based certification is a way of formalizing this link but stable, inter-personal relationships are also used in some food networks.

Qualities that are exclusively created at farm level (in these cases, ethical qualities) are transmitted directly from the farmer to the consumer either by direct contact or through posters, which are made possible by certification. The involvement of other actors in mediating "farm only" based qualities is limited. However actions to this end are undertaken.

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STANDPOINTS OF THE DIRECTORS OF AGRICULTURAL CO-OPERATIVES ABOUT THE MEMBERSHIP AND THE WORK OF COOPERATIVE UNIONS IN SERBIA

Miladin M. Ševarlić[1], Marija M. Nikolić[2], Richard Simmons[3]

Abstract

Goal of this paper is to analyse premises of directors of agricultural cooperatives towards cooperative associations, based on result of survey conducted on chosen sample. Analysis is based on the hypothesis that reform processes present in the Serbian economy, and completely absent from cooperative sector, have weaken the work of cooperative unions and undermined regular relations between cooperatives and their associations.

Paper also analyse premises of directors of cooperatives on relevant questions on membership and work of 12 regional, provincial and Cooperative union of Serbia, based on result of survey conducted in 148 or 7.2% of 2.055 agricultural cooperatives in Serbia.

For cooperatives that are not members of any union, paper gives systematization of reasons why cooperative is not member and motives that could inspire cooperative to become a member. For cooperatives that are members of some union, we give analyses of answers if cooperative is satisfied with work and activities of union conducted for cooperative welfare; and suggestions for activities that cooperative unions should practice in the interests and needs of their members.

Key words: director, premises - evaluation, membership, cooperatives, cooperative activities, cooperative unions.

Introduction

The Project „**Role and Potential of Cooperatives in Poverty Reduction“** in Serbia was implemented in cooperation between the *University of Stirling from Scotland*, the Faculty of Agriculture *of the University in Belgrade*[4]*,* and the *Association of Agricultural Economists of Serbia*. After the previous implementation of the projects of the same contents in Tanzania and Sri Lanka, Serbia was selected as, for the time being, the only European country in which such a research has been undertaken.

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4 According to the research of Ševarlić M. M. (2009), upon examination of available curricula of all the higher-education institutions (state and private) in the Republic of Serbia, the subject of instruction in the area of *cooperative movement* exists only in the curricula of the *Department of Agro-economy* at the *Faculty of Agriculture of the University in Belgrade*, specifically:

a) *Cooperative movement* – with the total of 45 classes of lectures and 15 classes of exercises in VI semester, which was attended, in the academic year 2008/09, by the last generation of students of the *basic studies* according to the so-called old curriculum; and

b) *Cooperative movement and association in agro-business* – with the total of 45 classes of lectures and 15 classes of exercises in IX semester, which are yet to be attended, in the academic year 2011/12, by the first generation of students of *graduate academic studies* according to the so-called Bologna curriculum.

The Project consisted of two parts:

~ *Desk* research work – with the aim to identify exact data and to calculate the derived indicators of the number, activities that take place, and the territorial distribution of cooperatives and cooperative associations in Serbia, in order to identify the representative sample for further analysis; and
~ *Field* research work – within which the directors of 240 selected cooperatives were interviewed.

In the first part of the research, the data were gathered from the Business Registers Agency (state in 2008), whereby all the entities were covered, which were registered in the form of cooperatives and cooperative associations, and also the other legal entities, which in their name have the words, such as „c*ooperative farm*" or "c*ooperative*", or acronyms: "c*o-op*", "c*op*" or "*coop*". Out of a total of 3,435 thus defined legal entities, 3,067 or 89.3% are cooperatives, 25 or 0.7% are cooperative associations, and the remaining 343 or 10.0% are other legal entities, which only use some of the above terms in the names of their respective companies.

Only those cooperatives that achieved positive financial result at least once in the period of 2005-2007 were selected in the subgroup of the sample for the survey, which was realized by 1,470 of them or 47.9% out of the total number of cooperatives. In line with the sectoral and regional structure of cooperatives that achieved positive financial result at least once within the specified three-year period, a total of 240 cooperatives were selected and surveyed using the questionnaire prepared in advance – which was compiled by the research workers from the University in Stirling.

As opposed to the countries in which this research had been previously conducted, in Serbia, ten questions[5] were added about the relationships of the cooperatives with the regional and/or sectoral cooperative unions as well as with the Cooperative Union of Serbia (CUS).

Out of 240 cooperatives in which the survey was conducted, 148 cooperatives are agricultural, which represents 7.2% of the total of 2,055 agricultural cooperatives registered in Serbia, or 16.3% of 907 agricultural cooperatives that achieved positive financial result at least once in the period of 2005-2007.

This paper contains the analysis of the answers and standpoints of the directors of 148 surveyed agricultural cooperatives concerning the relevant issues of membership and activities of the regional cooperative associations and of CUS. Subject to whether they are members of one of the cooperative unions or not, the surveyed agricultural cooperatives were classified in two basic subgroups:

~ 138 agricultural cooperatives or 93.2% of the total number of the surveyed agricultural cooperatives, which are members of some of the cooperative union; and
~ 10 agricultural cooperatives or 6.8% of the total surveyed agricultural cooperatives, the directors of which stated that their respective cooperatives are not members of any of the cooperative union in Serbia.

5 This set of questions was formulated by Professor D.Sc. Miladin M. Ševarlić – the manager of the Project in Serbia and M.Sc. Marija Nikolić – the coordinator of the team of interviewers who conducted the field survey.

Surveyed agricultural cooperatives that are the members of one of the cooperative unions

The directors of this dominant subgroup of agricultural cooperatives, in addition to specifying the name of the cooperative union they are the members of, answered a number of questions:

~ Which were the motives for becoming a member of the cooperative union;
~ Whether they are satisfied with the work of the cooperative union and if not, what activities would stimulate them to become satisfied;
~ Which was the last activity of the regional or sectoral cooperative union undertaken with the aim to protect the interests of the cooperative movement; and finally
~ Which was the last activity CUS has undertaken with the aim to protect the interests of the concrete cooperative.

Out of 138 surveyed agricultural cooperatives, which are members of one of cooperative unions, 128 directors or 92.8% stated that their cooperatives are the members of the Cooperative Union of Vojvodina or some of the county cooperative unions, and the remaining 10 directors stated that their cooperatives are the members directly of CUS – which indicates that 7.2% of the interviewed directors whose agricultural cooperatives are the members of cooperative unions actually do not know that cooperatives cannot be directly the members of CUS. In certain cooperatives they properly said that they are directly the members of the county or of the provincial cooperative unions, and through them, indirectly also the members of CUS. Although 25 cooperative unions are registered in the Business Registers Agency, for the analysis of the relationships between agricultural cooperatives and cooperative unions, it is necessary to eliminate five occupational non-agricultural cooperative unions and the Cooperative Union of Kosovo and Metohija – in view of the fact that the cooperatives that belong to the above associations are not covered by the survey research, so that there remain 19 potential cooperative unions of which the surveyed agricultural cooperatives could become members. None of the surveyed cooperatives is a member of four occupational agricultural cooperative unions[6]. Consequently, there remain 15 cooperative unions organized on the territorial principle and, upon completion of the survey, it was established that 12 or 80% of them are listed in the answers, which makes the sample particularly highly representative for the analysis of the relationships between the agricultural cooperatives and their cooperative unions.

We particularly point to the fact that just some directors from the territory of Srem in their responses stressed that their agricultural cooperatives are the members of the *County cooperative union of Srem*, while the directors of cooperatives from other regions in the Autonomous Province of Vojvodina (Banat and Bačka) specified only the membership in the Cooperative Union of Vojvodina (CAV) – which points to the processes of centralization of membership directly in the provincial cooperative union.

Apart from the county cooperative unions, which function within CUS, among those surveyed

6 Cooperative association of livestock and farm cooperatives **Banmlek** – Kikinda; Cooperative association of vegetable-growing and farm cooperatives **Povrtarska unija** (Vegetable-growing Union) – Begeč; Cooperative association of farm and vegetable-growing cooperatives **Agrologik** – Horgoš, and Cooperative association of farm and beekeeping cooperatives **Vojvođanska pčela** – Veternik.

were also 11 directors or 8.0% of the agricultural cooperatives, which are the members of the Union of Cooperatives in Šabac. This cooperative union was founded in 2005 and gathers together recently founded cooperatives with the aim to establish business connections between them, and it functions independently from CUS.

On the basis of the answers about the motives for becoming a member of cooperative unions, all the surveyed agricultural cooperatives, which are the members of some of the cooperative unions, are classified in six groups:

1. Exchange of timely information and raising of the level of dissemination of information, which was specified by 35 surveyed directors (25.4%) as the reason for becoming a member;
2. Becoming a member of cooperative unions was mandatory (34 or 24.6%);
3. Cooperation between cooperatives (18 or 13.0%);
4. Business interconnection and joint appearance in the market (17 or 12.3%);
5. Getting any form of aid (8 or 5.8%);
6. Other reasons (23 or 16.7%);

While in three cooperatives (2.2%) they did not want to specify the reason for becoming a member of a cooperative union.

All the answers that do not match with any of the above formulated answers were classified in the group „Other reasons", and which mutually do not have common elements, such as: winning recognition for the cooperative movement, institutional support, joint problem solving, preservation of the principles of the cooperative movement, and others.

The interviewed persons thereafter also responded to the question as to whether they are satisfied with the work of the cooperative union they are the members of, where the offered answers were:

~ Yes – which was chosen by a half of the interviewed directors of agricultural cooperatives (69 or 50.0%);
~ No – 47 cooperatives (34.1%) are not satisfied with the work of the cooperative union, and
~ I do not know – 20 (14.5%) of them stated that they do not know as to whether they are satisfied or not;

while, in 2 cooperatives (1.4%), they did not want to answer this question.

The directors of the surveyed agricultural cooperatives, who stated that they do not know or that they are not satisfied with the work of cooperative union (a total of 67 directors; 47 who were not satisfied and 20 who answered that they do not know as to whether they are satisfied), had the opportunity to chose, out of 10 offered activities, all those for which they find that they would improve the work of cooperative unions and increase the level of satisfaction of the cooperatives members. The question was of a semi-open-ended type, in view of the fact that the last activity was specified as „Other"where the surveyed persons could write what can be improved in the work of cooperative unions. The structure of answers is presented in table 1.

Most of the directors of cooperatives find that the activities of cooperative unions should be focused on participation in the drafting of the new law on cooperatives – as much as 77.6% of them selected this answer, which is consistent with the opinion of the majority of the surveyed persons, whom we interviewed, that the new law on cooperatives is necessary and that they look forward to it. The answer „Mediation in the contacts of cooperatives with

the government authorities“ also had a high frequency, which indicates dissatisfaction of the directors with the attitude of government bodies towards cooperatives, but, what is even more worrying, is the incompetence or inability of cooperative unions to assist in settling of possible disputes between cooperatives and government authorities and to articulate the requests of cooperatives from the government.

Table 1 - Classification of answers given by director of agricultural cooperatives on question *„ What activities should cooperative union be involved in, so that your cooperative is satisfied with its work?“*

Nmb	Given answers	Answers	
		number	%
1	Promoting interest of cooperatives and their members beyond cooperative movement	39	58,2
2	Intercession in contact of cooperatives and government bodies (when applying for sources, participate in projects and similar)	51	76,1
3	Creating stronger business relations between cooperatives that are members of union	34	50,7
4	More activity on transformation of social in coop property	39	58,2
5	Active participation in creating new law on cooperatives	52	77,6
6	Providing credits and / or other sources of finance under favourable conditions	49	73,1
7	Providing inputs under favourable conditions for production organised in cooperatives that are members of union	36	53,7
8	Help in sale of products	47	70,1
9	Organising seminars, lectures and presentation in order to promote advantages of cooperative work	42	62,7
10	Other[1]	2	3,0

Source: Calculation of authors based on survey conducted within Project “Role and Potential of Cooperatives in Poverty Reduction”, in period October - December 2008

The need for subsidized sources of financing (73.1%) was ranked third, implicating that almost three quarters of primary agricultural cooperatives suffer from lack of financial resources and expect financial support from the cooperative unions or at least support in providing help from other resources. It is important to point out that 70.1% of the interviewed directors of cooperatives, who were not satisfied with the work of cooperative unions, found that the union should offer assistance in the sale of products, which indicates dissatisfaction with the business function of cooperative unions.

Activities of cooperative unions

Comprehending of the relationship between cooperatives and cooperative unions is based on the results of the answers of the directors of cooperatives to two final questions in the survey:

(1) Specify the last activity undertaken by the regional or sectoral cooperative union with the aim to protect the interests of the cooperative movement; and
(2) Specify the last activity of the Cooperative Union of Serbia, which was undertaken with the aim to protect the interests of your cooperative.

The work of the regional cooperative unions was appraised on the basis of the answers of 128

directors of agricultural cooperatives, who stated that they are the members of some of the regional cooperative unions, while the work of CUS, in addition to them, was also appraised by 10 directors of cooperatives, who stated that they are members directly of CUS. In view of the fact that the questions were open-ended (the surveyed persons could, in their own words, answer the question put), the obtained answers were very much heterogeneous. Therefore, we analyzed the answers in two steps: in the first step, we only analyzed as to whether the surveyed persons specified any concrete activity or not (table 2), and, in the second step, we analyzed which concrete activities they specified and we systematized them in groups of related answers (table 3).

Out of 128 cooperatives, which are the members of one of the regional cooperative unions, in 95 or 74.3% of the cooperatives, they specified a concrete activity undertaken by the regional cooperative union with the aim to protect the interests of the cooperative movement. In 14 cases (10.9%) they claimed that the regional cooperative unions did nothing to protect the interests of the cooperative movement, while 19 surveyed persons (14.8%) answered that they do not know of or that they do not remember any activity of the regional cooperative union.

Table 2 - Analysis of answer given by director of cooperatives on question regarding work of regional and Cooperative Union of Serbia

	Regional cooperative unions				**Cooperative Union of Serbia**			
	Nothing	I do not know / can't remember	Given concrete activity	No answer	Nothing	I do not know / can't remember	Given concrete activity	No answer
Number of cooperatives	14	19	95	0	71	18	46	3
% (∑=100)	10,9	14,8	74,3	-	51,5	13,0	33,3	2,2

Source: Ibid, as in Table 1.

With respect to the work of the Cooperative Union of Serbia, the judgments were more severe. In only 46 surveys (33.3%), a concrete activity of CUS was specified, which was undertaken with the aim to protect the interests of the given cooperative, while in as much as 71 cooperatives (51.5%), they stated that nothing had been done, and in 18 cooperatives (13.0%) that they do not know of or that they do not remember any activity. In 3 cooperatives (2.2%), the surveyed persons did not answer to this question.

On the basis of the above stated, we may conclude as follows:

~ 128 cooperatives, which are the members of one of the regional cooperative unions, appraised their work, while the work of the Cooperative Union of Serbia was appraised by all 138 cooperatives, which are the members of any cooperative union in Serbia;
~ 74.3% of the members of the regional cooperative unions specified an activity undertaken with the aim to protect the interests of cooperatives, while only 33.3% did the same with respect to the work of CUS;
~ 10.9% of the surveyed persons assert that the regional cooperative unions did nothing for

the cooperatives, while over a half of them (51.5%) made the same statement for CUS; and

~ 14.8% of those surveyed answered that they do not know of or do not remember any activity of the regional cooperative unions of importance for the cooperative, and the same answer concerning the activities of CUS was given by 13.0% of the respondents.

The second segment of the analysis of the answers to the above questions was the review of concrete activities specified by the directors. The activities undertaken by the regional cooperative unions were analyzed separately from the activities of CUS, but, despite heterogeneous answers, groups of answers can be formed, which are common for all the unions (table 3).

The most often specified activity of the regional cooperative unions is related to rising of the level of dissemination of information, organizing of lectures, and various kinds of trainings – which was specified by 29 or 30.5% of the directors of cooperatives. This is directly related to the fact that more available and timely information was the motive for 25.4% of the surveyed directors to join cooperative unions, which to a certain extent explains the statement of a half of the directors that they are satisfied with their work. In the work of CUS, dominant activities are related to the assistance to cooperatives in appearances at fairs and other events (26.1%), then (as expected) there follow the activities on connecting cooperatives with the competent Ministry and other governmental institutions (23.9%), while their activities on organizing lectures, training, and dissemination of information are much less represented.

Table 3 - Concrete activities conducted by regional and Cooperative Union of Serbia in order to protect interests of cooperatives and cooperative movement

Group of activities conducted by regional and Cooperative Union of Serbia, according to answers of agricultural cooperatives directors	**Regional cooperative unions**		**Cooperative Union of Serbia**	
	number	**%**	**number**	**%**
Organising lectures, training and informing	29	30,5	5	10,9
Activities related to new law on cooperatives and other legal issues	18	18,9	7	15,2
Connecting cooperatives with Ministry of agriculture and other government bodies	11	11,6	11	23,9
Helping cooperatives when participating in fairs and other manifestations	5	5,3	12	26,1
Activities related to status of cooperative property	6	6,3	–	–
Help and support of regional cooperative unions	8	8,5	–	–
Advisory role	–	–	4	8,7
Other activities*	18	18,9	7	15,2
Total	95	100,0	46	100,0

* In group „other activities“ of regional cooperative unions are included answers such as: creating price-list, occasional program on television, affirmation of cooperatives, etc; in the same group of answers regarding work of Cooperative Union of Serbia are included: late support in plough of land in 2007, control of financial work of cooperative, audit of cooperative and others.

Source: Ibid, as in Table 1.

Surveyed agricultural cooperatives that are not members of any cooperative union

Out of the total of 148 surveyed agricultural cooperatives, 10 or 6.8% of the cooperatives are not members of any of cooperative union.

The reasons due to which the surveyed cooperatives are not members of any union are rather versatile, but we will fully specify them (due to a small number of cooperatives):

~ Lack of information and communication were stated in three cases, out of which one respondent also specified the lack of trust (30%);
~ Lack of money for the membership fee was specified in two cases (20%);
~ Lack of time was specified in two cooperatives (20%), although one of these cooperatives also added a small volume of work - which is contradictory to the answer concerning the lack of time;
~ Services of the cooperative union are not adequate to the needs of the cooperative - this was specified in one case (10%);
~ In one case the obtained answer was that there is no concrete reason (10%);

and one respondent did not want to answer to this question (10%).

To the question as to what could represent a motive for cooperatives to become members of cooperative unions, three equally distributed answers were obtained from 2 directors of cooperatives or 20% (better dissemination of information, higher dedication of a cooperative union to the members, and that they do not know what could motivate cooperatives to become members of a cooperative union), while four directors (40%) stressed that their cooperatives would have a motive for membership if cooperative unions would provide direct services to them (procurement of input and sale of products, legal advice, and representation in disputes).

Conclusion

This paper is a part of the results of the research within the project „Role and Potential of Cooperatives in Poverty Reduction“, which was conducted on a sample of 148 or 7.8% of the total of 2,055 agricultural cooperatives in Serbia. Based on the gathered answers, the standpoints of the directors of 148 agricultural cooperatives with respect to the work of cooperative unions were analyzed.

Agricultural cooperatives were divided in two main groups depending on whether they are the members of any of the cooperative unions or not. Most of agricultural cooperatives (93.2%) are the members of cooperative unions. The following was specified as the most common motives for becoming a member: (1) exchange of timely information and rising of the level dissemination of information and (2) mandatory membership – which were the motives for precisely one half of the surveyed cooperatives to join cooperative unions. The same number of directors stated that they are satisfied with the work of cooperative unions; however, as much as 34.1% of them are not satisfied or 14.5% do not know whether they are satisfied. They find that cooperative unions should additionally engage in the drafting of the new law on cooperatives, that they should represent a solid link between the Ministry of Agriculture, Forestry, and Water Resources Management and/or other government authorities and the cooperatives, i.e. that they should strengthen their business function; all with the aim to make the cooperatives-members more satisfied with their work.

As to the so-far work of the regional and the Cooperative Union of Serbia, 10.9% of the

surveyed persons stated that the regional cooperative unions did noting, while over a half of them (51.5%) stated the same for CUS; 14.8% of them do not know of or do not remember any activity of the regional cooperative unions, and 13.0% - any activity of CUS; while a concrete activity of the regional cooperative unions was specified by 74.3%, and of CUS - only by 33.3% of the surveyed directors. As the most frequent activities undertaken by the regional cooperative unions they stated organizing of seminars, courses, and increasing of dissemination of information, while CUS most often assisted cooperatives in appearances at fairs and other events.

Based on the answers of the directors of ten surveyed agricultural cooperatives, we conclude that the lack of information, money or time are the most frequent reasons why those cooperatives are not members of cooperative unions, i.e. that elimination of these problems and strengthening of working activities of cooperative unions would represent a sufficient motive for becoming a member of them.

Based on answers analysis of directors of agricultural cooperatives, of which almost 34.1% are not satisfied with the work of cooperative unions, and a relatively high percentage of the directors of cooperatives were unsure with respect to the work of cooperative unions (who responded: „I do not know", „I do not remember", „I am not sure"or did not answer to certain questions), we can conclude that hypothesis on undermined relations between primarily cooperatives and their associations is **confirmed**.

The above specified results of the research lead to the following conclusions:

~ The biggest number of the surveyed directors of agricultural cooperatives stressed dissemination of information as the dominantly identifiable activity of cooperative unions from the moment of joining cooperative unions to the last activity undertaken by cooperative unions in favour of cooperatives; and
~ General judgment is considerably more favourable regarding the work of the regional cooperative unions compared to the Cooperative Union of Serbia, which to some extent can be explained by the fact that the regional cooperative unions are in a more regular and direct contact with cooperatives, i.e. that they are present in solving of their daily problems.

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(Footnotes)

1 In two cooperatives, directors think that, in order to promote their work, cooperative unions should: (1) provide more useful things to cooperatives that are member of union, and (2) help cooperatives to apply for EU funds.

"THE METAPONTUM AGRO-FOOD DISTRICT OF QUALITY": A CASE STUDY OF KNOWLEDGE, INNOVATION AND IMPROVEMENT OF HUMAN CAPITAL IN TERRITORIAL RURAL DEVELOPMENT

Francesco Contò[1], Piermichele La Sala[2], Paolo Papapietro[3]

Abstract

The aim of this research is to find a concrete construction methodology of the Metapontum Agro - food district by three main phases: **awaking** of the operators and the institutional stakeholders (got together in the district's local web); **economic-territorial analysis**; **experimentation**.

This last phase will be the final step of the project, i.e. creation of the *Development Centre - Formative laboratory*, where both new methodologies of services' spreading on enterprises and new methodologies of formation-information for operators and new potential entrepreneurs will be tested.

This new methodology, based on the Learning Organization, **set in the usual "district approach" to the local development**, will employ information technology, solutions regarding the economic and the agricultural field, as well as training of human resources; this will follow the *PSR 2007 – 2013* of Basilicata Region and the rural development program (PIT for the district).

Therefore, after the analysis to identify the territorial organization of local development we can plan the new model of district, beginning from integrated supply chain.

This will facilitate the construction of a Society of District - Service Center can organize territorially local development and to optimize the planned investments from financial instruments offered by the PSR, to provide horizontal services (training, promotion, internationalization, etc.) to member companies to increase efficiency of management effectiveness.

In this context, based on the development of knowledge and ability to do business, underpinning the organization of the Center to ensure improved outcomes for companies and local business.

Key words: The Metapontum Agro-food district of quality, Concrete construction methodology of agro - food district, Creation of the shop of development, Formative laboratory, Information technology training of human resources solutions, Rural Development Program

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Introduction

The Metapontum Agro-food district of quality was acknowledged by Basilicata Region according to the D.G.R. nr.1256 of 24/05/2004 ; then it was established by the D.C.R. nr. 855 of 12/10/2004 according to the L.R. 1/2001.

The Metapontum plain stretches along the Jonio Sea; there are 12 towns in the province of Matera: Policoro, Scanzano Jonico, Nova Siri, Pisticci, Bernalda, Rotondella, Montescaglioso, Montalbano Jonico, Tursi, Colobraro, Valsinni and San Giorgio Lucano. The District has opened the organization and the orientation of the agricultural sector by interaction of several socioeconomic components of this area for all the inhabitants, and also by highlighting the multifunctional role of the agro-food system.

The opportunities offered by the District are very important; they are above all linked with the strengthening of the producers' contractual positions (to the market, the institutions, the credit system), the finishing of the main food chains of this area, the increase of the VA and the employment in the food chains, i.e. the increase of the communications in and out them.

The expected results would be: the improvement of this area and its agricultural production, the increase of skill to catalyze available resources, because of the consultation among the several present suitors (i.e. institutional suitors or socioeconomic ones).

The District represents an economic entity, built up by the entrepreneurs, which must answer for the area's governance in order to improve the self-development of the enterprises. It must consider the growing importance of natural resources and renewable ones for the development opportunities of the Metapontum area and its factories, which depend on these natural resources.

The Metapontum district aims at greatest involvement of entrepreneurs and operators by linking entrepreneurs and local organizations, developing social capital and a skill system in order to get a District Society, which can also be a District Service Centre.

Thus, the District must guarantee its governance of the local development through its Development Program, based on Training, Research, Transfer of Product and Method's Innovations.

Knowledge as source of competitive advantage: the intellectual capital

The complexity and the dynamism of the economic-productive, political-institutional and socio-cultural field in the last decade highlighted that the competitiveness of enterprises, systems of enterprise and of every organizing system is not based on traditional tangible goods and financial capitals only, but also on knowledge sources: these intangible sources guarantee bearable and lasting competitive differentials.

The same new economy's ideas are based on man and technology: the first one as main producer of value and richness in societies and organizations; the second one as spreading tool of knowledge and information or as business accelerator.

Organizations are understanding that their competitive skill are more and more linked with skill at identifying, getting, developing and running intangible and cognitive goods, which can bear the development of distinctive abilities.

Researches become different from the first ones in the theoretical study about value production

of knowledge:

According to **Resource-Based View**, the competitive advantage comes from resources (material and immaterial productive factors that the enterprise can exploit, because they belong to the enterprise or because they are controlled by it) and their exploitation. These resources are heterogeneous, matchless, critical, irreplaceable and rare.

In accordance with the **Competence-Based View** the enterprise's meaning is the skill to create, transfer, put together, complete and involve the knowledge subtending the abilities, which are a part of products and service offered by the enterprise to the market.

As a result, the competitive advantage comes from:

• Key abilities, i.e. coordination of technological and operative knowledge by collective learning;
• Dynamic abilities, i.e. organization of learning, adapting, modifying and improving yourself in order to satisfy your competitive field's need.

The **Knowledge-Based View** describes the enterprise as an institution for goods and service production, which can create conditions for integrating specialist knowledge from several sources. Exchange, sharing, and transfer of unspoken or spoken knowledge are important processes for value creation by the enterprise.

The difference between unspoken knowledge and spoken one is clear.

According to the **Learning Organization**, the enterprise is an organization aiming at creating, getting and communicating knowledge, in order to get better skills to adapt and answer to external problems.

On the contrary, the **Knowledge Creating Company'**s theory describes the enterprise as a system which can create new knowledge by knowledge conversion, spread them on the enterprise and transform them in products, service and system. As a matter of fact, the competitive advantage involves both spoken knowledge and unspoken one, but also a knowledge conversion process.

In the last decade the concept of intellectual capital had been introduced and developed as new interpretive category of cognitive resources, whose role and importance for the competitive development of organizations had been analyzed.

So, the strategic importance of cognitive and intangible resources and their interrelationships in value creation processes of specific organizing systems, such as the agro-food organizations, are very interesting to analyze. "Valuating and managing the intellectual capital represent the only lever in order to hold up the dynamics of development and welfare creation. According to the present Knowledge Economy, the Italian economic-productive system, and above all the Southern one, can hold up its dynamics of development and begin new value creation paths, only if it can exploit and manage the rich intangible resources heritage of entrepreneurial systems" (Schiuma G., 2007).

Today the competitive abilities of local productive systems and public or private organizing systems are based on skills to define and develop managerial strategies and actions, aiming at developing, attracting and exploiting cognitive and intangible resources, which can create competitive advantage.

In order to understand how the economic development dynamics are changing themselves and how they can be transformed to hold up value and welfare local creation processes, you are supposed to understand how the local productive systems can change themselves to **intelligent areas.** According to the **knowledge economy**, the development dynamics of organizations and local systems are based on exploitation of cognitive and intangible resources and intangible facilities. As a matter of fact, the only financial and structural resources cannot guarantee virtuous circles of economic increase. The supportable economic development dynamics are going to be more and more led by those territories which will be able to develop system intelligence and work according to this intelligence.

As a result, very important is the skill to manage and develop the intellectual capital as human, social and organizing capital. It becomes the key interpretation for denoting cognitive and intangible resources having an important role to describe the value of a local productive system.

In conformity with these ideas, the Metapontum District has to lead its Program of District Development.

The building of the District

The aim of this paper is to research and apply a new methodology which can awake, analyze and so try out the building of the District.

The project is divided into three phases: awaking of the operators and the institutional stakeholders; economic-territorial analysis; experimentation.

The **awaking** means to tell the entrepreneurs about the building of the District and everything is linked with it. During this phase you are supposed to involve the most of the local productive system enterprises, and to have relationships with the professional organizations (OOPP) and Producers' Organizations (OP), in order to plan all the programmed activities in the best way.

The **economic-territorial analysis** needs a deep study about the territory, the factories and the agricultural markets and the local opportunities or their lack.

To conclude, the **experimentation** aims at evaluating the results and building the District by creating a Development Centre and Formative Laboratory, which can highlight the intellectual capital's role of its local productive system.

The aim is the development of the organization's performances and the exploitation of human knowledge and resources.

This project idea is based on the **Learning Organization**; it exploits a flowing method for problem solving at different levels.

"An organization can learn when its members allow the sharing of information, experiences, discoveries and evaluation, in order to build a common heritage for all the staff" (Contò, 2008). In this way, knowledge managed as competitive advantage, faster making-decisions process of the organization and increase of competitiveness become possible.

The organizations need to develop the collective and the individual skills, and to interact among enterprises to prime those development process which increase competitiveness in

the all enterprise system.

So, the task of this project is to cause a lever effect for developing all the area, and above all the agro-food field. This task finds expression in the realization of a "**laboratory for professionalism development of linked industries to agro-food of quality**", that supports the skill quality and the permanence in the work market by the enrichment of the individual and collective socio-technical heritage.

In conformity with this vision, the experimentation of the "**Service Centre of the Metapontum Agro-food District of Quality**" happens for spreading activities of:

- Territorial Coordination
- Spreading of Real Service
- Exploitation of the District Resources
- Technological Transfer and higher Formation.

The task of the experimental structure is based on:

- a Development Centre (territorial centre and informatics one)
- a Learning Laboratory.

It is supposed to be an interface among the local industries and the spreading service organizations.

The Service Centre will be an entrepreneurial suitor aiming at collecting the district enterprises around on line spread service and giving them efficiencies, large economies and opening to new markets reachable thanks to new technologies.

The tasks of the Territorial Centre are:

- spreading the project over the area by communication actions and meetings;
- welcoming and giving information;
- being an interface and a meeting place between the technical secretary and the centre users;
- spreading service.

The experimentation will deal with the following service:

- content management as support of District innovation processes;
- internationalization;
- spreading of quality certifications and systems of food chain traceability;
- local marketing;
- transfer of technological innovations;
- cooperative work;
- helping to enterprise creation;
- access to contributes, funding and tax relieves.

The experimental structure will work as "Learning Laboratory" by:

1. spreading of blended formative paths (room/fad);
2. realization of workshops in itinere.

The spreading of formative paths aims at:

- creation of development helper for workers coming from several public and private local

organizations, and also for managing of new intervention methodologies exploiting all the local resources;

- orienting the promotion and the creation of new enterprises in order to integrate knowledge of a young target with technical-specialist one needed by the creation of new entrepreneurial actions.

The aims of the Formative Laboratory are:

1. covering the professional skill gaps of the agro-food field;
2. promoting the spreading of a "district culture".

The first aim will be reached by methodologies and technologies for the Far Formation. The second one will be reached by methodologies aiming at increasing Learning Organization processes, such as the Harold Methodology.

An organization becomes a *Learning Organization*, if it has shared visions and knowledge, and brain models, getting ready to:

- experiment and apply new knowledge;
- learn from past experiences for gaining from mistakes and successes;
- learn from others;
- make bigger the external learning places;
- fast spread the learning results for sharing them with whom works in the organization.

The Harold Methodology had been developed for increasing the learning potential of organizations; it aims at influencing their cross-activities, such as:

- communication and listening ways;
- team-working;
- information sharing and decisions-making.

Thus, the methodology's task is to give to the district PMI the needed skills for modifying their organization and above all their organizing culture in order to a "constant learning".

Thanks to this district model, you create a methodology which can put together agro-economic, informatics and human resources formation solutions, as stated in the Development Program of the Metapontum Agro-food District of Quality.

The district organization of the local development

In conformity with the new development perspectives of the agricultural field, the role of the local productive systems is very important for local development and investment policies. The districts and the local productive systems are new entries into the new programmatic model of the UE's development policy, because they have a fly-wheel role in its applying; as a matter of fact, this policy is based on territorial-making actions. For instance the Rural Development Policy, which is a strong point in the 2007-2013 planning system, is based on a strategic, integrated and territorial approach, and on the main role of the local partners in the development strategies promoting. So, the UE's rules about the rural development and the Common Market Organizations (OCM) apply for consultation and partnering strategy, involving the stakeholders in all the planning and realization steps of those programs.

It means to adopt dialogues and comparisons among regional administration, local organizations and socio-economic forces, in order to make shared choice and so to create more efficient investments

and skills to control the executive processes and their results. In this way, the local productive systems become **territorial organizers of joining of each factory to the PSR: they promote and enliven the area for searching factories and projecting with them the Food Chain Integrated Programs.**

According also to the birth of Local Communities and the Leader approach promoted by the PSR thanks to the Local Action Groups (GAL), the Metapontum District can realize the territorial organization model of the rural development. The common starting point is the homogeneity of the socio-economic and productive context of this area. On the contrary, the tasks of the several local operators are different and complementary: **technical tools of operative support (District and GAL)**, linking the administrative organizations (the Provinces) with the enterprises, are controlled by the **Planning Organization (the Region)**, making programmatic choices thanks to consultation and territorial-making actions.

These technical tools are divided into **territorial promotion tools (GAL)**, linking with the territory and the III and IV PSR's Axis, and economic-productive ones for the factories development (the District), linking with local factories and the I and II PSR's Axis (food chain programs, factory investments, innovations transfer for local factories – factory impact – and common service development, i.e. creation of the Service Centre for the same local factories – territorial impact).

The interaction between these technical tools of operative support (**GAL agreement pact - District**) allows enterprises and territory to share development ideas and projects.

Thus:

- you need to develop two different organisms having different and complementary tasks, because the GAL cannot manage the I and II Axis' rules with all the first pillar's activities: i.e. OCM and OP (on the contrary, the District can do it);
- the District aims at promoting and creating local networks among the vertical subjects (food chain factories), and between them and the development transversal subjects (Cities, Banks, Universities, service, professional classes, etc…). I.e. they manage the relationships between users and providers of: research, technological innovations, streets, facilities, energy, transports, logistics, credit, factory consulting, etc…;
- So, the local suitors and stakeholders (the Province and OOPP) apply the rural and productive development policies (sectorial: cereals, oil, wine, milk, etc…) by two different tools: the GAL (for everything dealing with the III and IV PSR's Axis) and the District (for every main action of the I and II Axis, and above all for linking factories with themselves and the outside).

According to this context, the Centre and the Laboratory become the operative tools which the district can manage as territorial organizer of the local development.

In this view, the trial of the "Service Center of the District Food Quality of Metapontino" takes place with the aim of providing a set of priority activities:

- Local Coordination
- Provision of real services
- Use of Resources District
- Technology Transfer and Higher Education and promote the implementation of appropriate

strategies for territorial development and sustainable integrated rural character, based on the determination made by the District Development Program.

The function of the experimental structure is composed of:

- Development of an *Development Office* (*Development Desk and ICT Desk*);
- A learning laboratory.

It has the intent to act as an interface between the firms in the region and local agencies can deliver services.

The Service Center will serve as a business entity seeking to aggregate their businesses in the district around a set of services delivered online and to provide the community aggregate efficiencies, economies of scale and openness to new markets that the use of new technologies allow today to achieve. Will also play an active role in external markets with the aim to raise awareness and promote the spread of land resources and collect efficiencies and economies of scale that the Internet makes possible.

The Development Office is the main instrument of Service Center of the District Food Quality of Metapontino, with which the territory can inform, make requests and receive advice and personalized services.

The operation of the facility area are:

- Animate and disseminate within the project through appropriate communication activities and conferences;
- Get involved and provide information;
- Act as an interface and place of meeting between the Technical Secretariat and the users of the Facility;
- Deliver services. The trial will cover the following services:
- Content management to support innovation processes in the district;
- Internationalization;
- Dissemination of the certificates of quality and traceability systems;
- Marketing planning;
- Transfer of technological innovations;
- Cooperative work;
- Assist in creation of enterprise;
- Access to grants, loans, facilities.

The structure will serve as experimental "learning laboratory" through:
1. the provision of training in blended mode (classroom / fad);
2. the realization of workshops pitches.

The provision of training is aimed at:

- Creation of the position of facilitator of development, open to staff from various public and private structures operating on the territory of reference regarding the utilization of methods of intervention for the enhancement of local economies, using for this purpose all the resources of the territory;
- Guiding and promoting the creation of new enterprises, with the aim of integrating the basic knowledge of the younger market with the knowledge and technical expertise necessary for the emergence of new business initiatives in the social fabric and support in start-ups.

The objectives of the workshop training consist of:

1. Bridging the gap in skills identified in the agricultural sector;
2. Facilitate the spread of a "culture district.

The first objective will be achieved through the use of methodologies and technologies for Distance Learning;

The second objective will be attained by the application of methodologies aimed at enhancing the processes of learning organization, such as, for example, Methodology Harold. Become a Learning Organization if an organization is able to achieve shared visions, knowledge and shared mental models, by providing:

- to experiment and apply new knowledge;
- to learn from past experiences in order to benefit from the mistakes made and successes achieved;
- to learn from others;
- to broaden the opportunities for learning outside environment;
- to spread, quickly and effectively, learning outcomes, for they are shared by those working in the organization.

Harold - methodology was specifically developed to enhance the learning potential of organizations and seeks to influence some cross-organization activities, such as:

- modes of communication and listening;
- teamwork;
- information sharing and decision making.
- Objective of the methodology is thus to provide SMEs with the skills necessary for the district change its organization and in particular its organizational culture perspective of a system of "lifelong learning".

Through the proposed district model is constructed, therefore, a methodology capable of putting together the solutions of an economic - agriculture, IT and human resources training, in line with the strategies defined in the Development Program of the District Quality of Food Metapontino.

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KNOWLEDGE PRODUCTION, MULTIFUNCTIONALITY OF AGRICULTURE AND PUBLIC DECISIONS: CRITICAL ISSUES OF CONTEMPORARY CONTROVERSIES

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Abstract

Various theoretical models of public policy analysis are used to treat situations of decision-making in which public deciders have to take into account the multifunctionality of agriculture. For some, science-society relations are not really problematical. Others acknowledge the current attempts of these policy-makers to find adequate scientific knowledge, and the difficulties they encounter. These difficulties stem partly from the very content of knowledge produced by research. Could other modes of production be more efficient? The status of the knowledge produced by these approaches is a subject of debate. Bridging the divide between science and policy more effectively is not only a question of knowledge brokerage. Accessibility and reliability of the existing evidences are also problems to be addressed. The debates around evidence-based practices may provide some landmarks in this new situation although they also emphasize the limits of the tools that can be built for this purpose.

Key words: Multifunctionality, agriculture, knowledge, policy

Introduction

The necessity of taking into account the multiple functions of agriculture (economic, social, environmental) is regularly reasserted by policy-makers (EC 2003). Agreement is increasingly widespread in the community of agricultural economists, as well as in other disciplines, on the need to reshape current analyses of agriculture accordingly (de Janvry 2009). Opinions differ, however, when it comes to the role that scientific knowledge[6] can play in the emergence of new policies.

As this issue of the relations between science and policy has been analysed from very different standpoints, it is difficult to obtain a clear picture of what is at stake in the current controversies. In recent years some epistemic confusion has consequently been the source of many misunderstandings between researchers themselves and between researchers and policy

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6 "Scientific knowledge" i.e. knowledge related to a theory and which meets specific validation criteria: making the validation procedures explicit, and setting them out to be presented to peers, so that the knowledge produced transcends the individual subjectivity of the researcher concerned.

makers (Laurent 2003). The aim of this paper is to provide some insights to contribute to overcoming such misunderstanding.

First, we examine the various theoretical models of public policy analysis that serve as a reference in the study of those decision-making situations in which public deciders wish to take the multifunctionality of agriculture (MFA) into account. While some consider that the situation is not really problematical, others rely on findings showing that in many situations policy-makers try to mobilize validated knowledge for decision making but encounter many difficulties (Section 1). This is partly due to the content of the knowledge produced by research. Might new modes of knowledge production be more efficient? The status of knowledge produced by various approaches is a subject of debate (Section 2). The question of bridging the gap between science and policy more effectively is not only one of knowledge brokerage, for while the actual content of knowledge is often not adequate to deal with MFA issues, in addition its reliability and accessibility are problematical. Debates around evidence-based practices may provide some landmarks in this new situation (Section 3). This analysis shows the possibility of playing on the complementarities between different approaches to take the MFA into account more fully.

1. Are research outputs likely to contribute to policy-making? Discord between public policy decision models

While in the economic analysis of firms it is recognized that knowledge is a key resource, the same does not apply to public policy-making. For example, to predict and evaluate the effects of alternative agricultural policies on the protection of biodiversity, or the impact of environmental policies on the functioning of farms, one needs some knowledge on the mechanisms through which economic, social, biotechnological and ecological processes are articulated. But there is a lack of adequate knowledge and up-dated data, highlighted in the Millennium Ecosystem Assessment reports (Carpenter*etal.* 2006).

In such a situation, is it necessary to undertake specific actions so that available scientific knowledge can be better adjusted to the needs of public policy-makers? The answers differ as to the extent to which public intervention could be based on scientific knowledge. The models designed to account for how this knowledge enters public policy-making have been extensively described, and are a lasting source of controversy (Lindblom 1959). Schematically, theses models highlight three main types of logic.

(i) The ideal type of the "rational model", embedded in the theory of rational choices, describes a situation where policy-makers proceed rationally via a series of logical, ordered phases, assess and compare all options, and calculate all the social, political and economic costs and benefits of a public policy. In this model, researchers and policy-makers (or any other actor) collaborate "naturally"; they have the time, competencies and material means enabling them to assess all available information. The mobilization of scientific knowledge is not really problematical, but improvement of the current situation are sought to reduce asymmetries of information and to update data. This type of representation has guided research aimed at proposing standard tools so that MFA can be taken into account in public policies (OECD 2001).

(ii) At the other extreme, certain studies highlight situations of organizational anarchy, where public deciders do not even try to inform their decision with any reliable scientific knowledge whatsoever. As irrationality prevails, it is posited that no one endeavours to overcome the obstacles. Such cases can indeed be found, for instance when some administrations sometimes hurriedly put together arguments for international negotiations on various functions of agriculture.

Yet a convergent set of findings shows that in many situations public deciders do not behave according to the "rational model" and still seek reliable knowledge to facilitate decision making. This is the case for example when the technical services of the ministries in charge of agriculture and the environment have to define the technical content of agri-environmental measures (Laurent*etal.* 2008).

(iii) Models based on other sets of hypotheses – especially models of bounded rationality – have been developed to account for the actual motivations, difficulties and strategies encountered in mobilizing available knowledge in situations where political, economic, ecological and other constraints are combined. Each of them (bounded rationality models, incremental model, iterative model, etc.) sheds light on a particular aspect of the way in which scientific knowledge may enter into public decision-making.

For action, this leads to two different points of view:

- Some researchers and policy-makers maintain that it may be useful to consider the methods and tools which facilitate *a more judicious use of available knowledge*, especially knowledge produced by research, even if science is always incomplete and even if the decision-making process never corresponds to the ideal type of the "rational model" (Nutley 2003). For instance, in the 2000s various institutions (European Commission, ministries in charge of agriculture and the environment, local authorities, etc.) commissioned numerous states of the art, to take stock of available knowledge so that policies taking MFA into account could be implemented.

- Other studies consider that "the problem is not in the data" but in the ability of institutions to *learn* in situations of uncertainty (Parsons 2002); even if public deciders sometimes try to use available knowledge effectively, this project will fail. These approaches have been developed in the field of MFA, for example to build systems for managing water catchment (Ison *etal.* 2007). The social sciences are called on no longer primarily to provide basic knowledge on economic and social mechanisms or those linking social with ecological processes, validated according to academic norms (peer reviewing), but rather to contribute to the learning process on how to manage uncertainty and to produce a new type of knowledge with other stakeholders. According to some extreme epistemic positions such as post-normal science, such knowledge will be assessed on new bases by the wide range of stakeholders concerned: "science is no longer imagined as delivering truth, and it follows a new organizing principle, that of quality", "quality" involving "usefulness", "ability to generate consensus in decision making", "adequacy to local context" (Funtowicz & Ravetz 1994).

2. What kind of research output? The epistemic status of various types of knowledge

Thus, the environment and its relations with various productive sectors – including agriculture – is a field of intense controversy over the types of knowledge that should be produced by research to be mobilized for action. Gibbons*etal.* (1994) and Nowotny*etal.* (2003) point out that alongside the traditional mode of production of scientific knowledge (Mode 1) a new type of research has developed (Mode 2) with various streams, such as post-normal science, mentioned above. These are based on "transdisciplinary" approaches, i.e. approaches associating scientists and non-academic stakeholders not only to decide on priorities for research, but also to conduct research and to evaluate it by focusing on the contextualization of the results and their ability to be used for action, rather than on traditional academic validation criteria. In so doing they identify certain devices which can improve one of the key aspects of science-society relations: the social relevance of research results.

Nevertheless these authors say nothing of one of the critical points of some Mode 2 approaches: the status of scientific knowledge compared to other forms of knowledge (tacit knowledge, traditional knowledge, etc.). Whereas for sociological analysis it may be interesting to consider all types of knowledge at the same level, in order to examine how they are combined in various decision-making situations, for when it comes to action not all types of knowledge are equivalent. Regarding research, we can assume that society expects scientists to provide scientific knowledge whose limits of reliability are tested by means of explicit procedures.

In this respect there is a major divide between communities of researchers (Shinn & Ragouet 2005), including those working on MFA. While some consider that scientific knowledge has particular epistemic properties (resulting from the modalities of its validation), others refuse this idea or avoid the question in their research practices and in building the models that they propose for decision-making.

Hence, studies that recommend involving non-academic partners in all stages of research can produce sophisticated models combining heterogeneous types of information and knowledge; variables and parameters may stem partly from validated scientific facts but also partly from the opinions of the people participating in the process (collected for instance through role-playing). Some studies on MFA adopt these principles, especially as regards collective water management. The opinions of the non-academic actors involved in research can thus be substituted for (and not complementary to) scientific evidence, especially for social science results. The scientific knowledge that is injected into such models consists primarily of data from ecology or biophysical and biotechnological disciplines. The socio-economic aspects are often reduced to the self-assessment, by the stakeholders involved in the project, of the socio-economic acceptability of alternative technical solutions. In this way they avoid costly processes of compiling reliable databases necessitating economic and social data (on the structures and functioning of different types of farm, on systems of households' work, their insertion in regimes of land-ownership, power relations, social contradictions, etc.). From the point of view of the social sciences, the nature of the outputs thus produced and their reliability are questionable.

These approaches are in sharp contrast with evidence-based practices, which consider that not all types of knowledge are equivalent for action, and which recognize that there are difficulties in using the available knowledge – especially scientific knowledge – but propose various organizational and analytical tools to facilitate its rational use.

3. How to make the most of existing scientific knowledge for MFA issues? Learning from debates on evidence-based practices

If one recognizes that: i) the way in which knowledge contributes to public decision-making differs substantially from the "rational model", yet that ii) there are situations in which policy-makers would like to make a more judicious use of the available knowledge, especially scientific knowledge, to meet policy objectives, and that iii) this is no extravagant wish, for there is room to improve the existing situation as regards knowledge produced by both the social sciences and the natural sciences, then it would be useful to investigate more fully the conditions allowing for knowledge spawned by research to be used as judiciously as possible.

This is how a new field of investigation – and controversy – is developing, primarily around the notion of "evidence-based" practices which aim to improve the use of knowledge in decision-making, especially (but not exclusively) scientific knowledge (Nutley 2003). As Omamo (2004) points out, these studies are not specifically embedded in one model of policy-making, even if they stem from the statement that the underlying hypotheses of the rational model are

unrealistic (impossibility of having access to most of the available knowledge, asymmetry of information between actors, limitation of intellectual capacities of any individual, etc.). Overall, they acknowledge the transformation of the regime of access to scientific knowledge (increasing abundance of research production, lack of meta data on knowledge reliability, etc.) and the need to elaborate new tools to bridge the science–policy divide more effectively.

Improvements are therefore sought in three main directions:

i) The production of synthetic analyses on precise questions intended for different types of actor, notably in the form of "systematic reviews" (i.e. particular presentations of states of the art, describing available knowledge so that it can be used to address an issue in practical terms). Such studies have been undertaken to back up policies to protect biodiversity, for example when decisions have to be made on the technical content of agri-environmental measures (recommended practices, etc.) (e.g. the Centre for Evidence-based Conservation, Birmingham University). Other MFA issues (especially regarding the socio-economic impacts of environmental policies) are however still in an embryonic form.

ii) Making explicit the quality criteria of evidence used to assess the reliability of available knowledge for action, and to enable potential users to make informed choices. This consists in establishing frameworks of analysis so that an opinion is not considered to provide the same level of proof as the conclusions drawn from a monograph, or as knowledge based on the findings of controlled comparisons for which the degree of significance of the results can be tested. It also consists in drawing up an inventory of the fields for which the level of evidence remains low, and identifying major knowledge gaps for programming research (e.g. in various aspects of organic farming and its technical and economic performance).

iii) Finally, the setting up of ad hoc organizations to facilitate direct access, by the various actors concerned, to available knowledge (knowledge bases in open access, with systematic reviews, databases, etc.). In the field of agriculture, the British Department for Environment, Food and Rural Affairs (DEFRA) has partially reorganized its activities to promote such synergies.

Yet these approaches, like the preceding ones, have many limits which are often described – difficulties in ranking competing evidence from different disciplines or presented by different interest groups, high cost of systematic reviews, etc. – and they fail to address many of the institutional aspects of decision-making. Still, as argued by S.Nutley (2003) "neither definitive research evidence nor rational decision making are essential requirements for the development of more evidence-informed policy".

Conclusion

It is important to have the clearest view possible of the various ways of conceiving of the role of scientific knowledge in public decision-making involving MFA, for they result in very different guiding principles for subsequent action.

Regarding the "rational model", there is widespread agreement that it can be described but not practised except for relatively simple problems and even then, in somewhat modified forms. This does not however mean that no attempts are made by public deciders to partially base their decisions on scientific knowledge. In the MFA area, several ways are explored. Although they may appear mutually exclusive from a theoretical standpoint, each of them makes it possible to illuminate different facets of complex systems where public decision-

making brings into play networks of actors with sometimes conflicting objectives. Yet the mobilization of these approaches in a spirit of complementarity has hardly begun.

The stakes are not only academic. Knowledge, like land, capital and labour, is an instrument of power as well as an essential resource for social and economic development. It is a resource whose quality, reliability and accessibility matter, to support debates on alternative ways to development, and to seek the most effective actions according to objectives set by the actors for different types of action. This resource has to be integrated as such into the economic analysis of development models and their mode of regulation.

It is important not to overlook this dimension in the interdisciplinary scientific debates in which MFA-related issues are discussed. Following some extreme points of view, the social sciences can be relegated to a narrow role of assisting learning processes because they do not produce the same kind of knowledge as the natural sciences; the advantages of them producing verified knowledge can be denied. A considerable amount of conceptual and methodological knowledge (e.g. on structural changes), which is invaluable for reasoning in terms of MFA, can thus be left aside. Economists have a specific responsibility in this respect, as many studies show the limits of economic approaches that multiply prescriptions but exempt themselves from all empirical verification and refuse to set the limits of the validity of their own recommendations. That is why it seems necessary to the develop a third way where individuals' and organizations' capacities for adaptation have to be improved, where knowledge gaps on MFA has to be reduced by producing the most reliable evidences possible, explicitly showing the limits of their own validity.

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AGRIFOOD INDUSTRY AS INDUSTRY INTENSIVELY BASED ON KNOWLEDGE - CASE STUDY OF VOJVODINA

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Abstract

During three-hundred-year history of the market economy, the main sources of wealth creation have changed from the natural resources (mainly land and relatively unskilled labor with the exception of the master craftsman), tangible material assets (buildings, machinery and equipment, funds) to intangible assets (knowledge and information of all types) that may be contained in the people, organizations, or physical resources. In the later period of the twentieth century, science has acquired the features of direct production force. The term direct implies that unlike the relationship which existed between science and production in the IXX century, where scientific advances was incorporated through the physical labor in the tools, which, in turn, created new value through the physical labor, the relationship between science and production has become all direct, immediate, because the scientific advances allowed the funds to be produced with less labor and allowed funds itself to become "smarter" and as such to require less human intervention and human physical labor in the final production process. As a result, the need for physical labor continuously declined with time, and the application of labor is moved from direct production to processes of preparing and organizing production. Also, a large part of today's knowledge that is used in production is not embodied in machinery, and the effects of this are immense.

Key words: agricultural industry, Vojvodina, intellectual capital, efficiency, valorisation.

Introduction

By the middle of 1990s, the economic academic and expert literature introduced the term **"knowledge based economy" in to a wide use as a framework term describing a new social-economic paradigm that is the consequence of significant and intensive changes that arose by the end of the 20th century. Those changes were essentially caused by tremendous increase in the overall social fund of knowledge and greater social distribution of knowledge. New technologies affected changes of previous linear and sequential matrixes of innovating into a new interactive, dynamic and network matrix of innovation processes, which enabled fast and intensive production of new knowledge and enhancement of the existing one, where innovators were provide easier access to knowledge of their predecessors (Foray, D., B.A Lundvall, 1996.). In addition, knowledge started spreading more quickly and easily and it became more accessible to wider social layers. Knowledge and human capital have become the basic resources in process of value creation and generation of sustainable competitive advantages of companies and nations. This resulted with shifting of traditional perspective of comprehension of economy of**

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the industrial age to comprehension of economy from the aspect of new reality of the information era and knowledge based economy.

It has been noted that the speed of changes and transformation depend more and more on accessibility of new knowledge and quality of knowledge. Naturally, technology played an important role here. The technology is the driving engine of changes and knowledge is the fuel (Drucker, P. 1993). At the beginning of the industrial revolution knowledge was applied to tools, processes, and products. In later stages, knowledge was applied to productivity increase. Nowadays, knowledge is applied to knowledge itself. This revolution produced more accelerated and sustainable changes which represent the most significant forces that shape today's society.

Subject and objectives of research

Subject of this paper includes the studying significance and role of knowledge (theoretical and empirical aspects) as strategic resource in agrifood sector of Vojvodina.

The objective of this research is measure of efficiency of use of intellectual capital by Vojvodina companies operating within this field.

Methodology and data sources

In contest of rising importance of knowledge and competencies as key strategic resources and regarding that Industrial Age measures of firm performance focus mainly on the financial criteria as the gauge for success, autors use ***Value added Intelectual Capital Coefficient - VAIC*** as a method for measuring business performance which is more suitable for understanding subject and objectives of their research. VAIC measure belongs to *Output Oriented-Process Methods* of measuring intellectual capital. This methodology attempt to measure the amount of intellectual capital output from a defined amount of input related to a specific type of driver(s) underlying a company's physical and intellectual capital. VAIC is built on the premise that value creation is derived from two primary resource bases: (1) physical capital resources (i.e., the tangible and financial capital employed by the firm to create wealth); and (2) intellectual capital resources (i.e., the value created by a firm's human and the structural capital resources – items emancipating from the firm's human capital resources such as organization structure, patents, brand, customer relationships). To determine the efficiency of value created each major resource base is linked to the creation of value added. VAIC provides an indication of the total efficiency of value creation from all resources employed. An important subset term, *ICE* (sum of *HCE* and *SCE*) reflects the efficiency of value created by the intellectual capital employed.

Data for analysis were obtained from the National Bank of Serbia and they were generated from annual financial reports of companies, namely, balance sheets and profit and loss statements for the year 2007[4].

Knowledge based economy - theoretical approach

Modern society can be described as a society based on a deep and broad penetration of scientific

4 Because of shortage of avalable and sistematized data for long time period Authors coud not conduct research of the phenomenon within a longer period that would provide much more realistic picture of success of business operations of those companies. We analysed the data only for one year (2007). Therefore, results from analysis should be except with reserve.

and technological knowledge in all spheres of social life and its institutions. By the mid-twentieth century society and economy were primarily understood in the context of physical resources and physical labor. As such, these concepts have long been present in sociological,economic and political theories. However, in modern society one perceives the tendency of decreasing importance of physical resources and physical labor as the basic factors of production and sources of value creation. Although until recently these factors represented fundamental determinants of terms of property and labor.Today, the concept of property and labor is extended to intangible elements of their structure.The traditional characteristics of property and labor did not disappear. However, what is new is that property and labour, more than ever before, embedded in them the intangible component -**knowledg**e. Therefore, the knowledge society phenomenon indicates the significant structural economic changes and the transition of the industrial economy to economy intensively based on knowledge. Consequently, grouping of economic sectors in those intensively based on high-tech and knowledge becomes less and less meaningful, because now the so-called traditional economic sectors (manufacturing, textile, food, etc.), are as based on knowledge and the outputs of tangible and intangible technological knowledge as so-called high technology sectors[5]. Since OECD clasifications of high tehnology industries, medium tech and low tech industries rests on only one indicator, namely intramural R&D, this is open to two important objections. First, it is by no means the only measure of knowledge-creating activities. Second, it ignores the fact that the knowledge that is relevant to an industry may be distributed across many sectors or agents: thus a low-R&D industry may well be an major user of knowledge generated elsewhere. Also, the definitions of R&D in the OECD's *Frascati Manual*, which structure R&D data collection in OECD economies, exclude a wide range of activities that involve the creation or use of new knowledge in innovation[6].

Modern innovation theory sees knowledge creation in a much more diffuse way. Firstly, innovation rests not on discovery but on learning. Learning need not necessarily imply discovery of new technical or scientific principles, and can equally be based on activities which recombine or adapt existing forms of knowledge; this in turn implies that activities such design and trial production (which is a form of engineering experimentation) can be knowledge-generating activities (Lundvall, B.Å. 2003). A second key emphasis in modern innovation analysis is on the external environment of the firm. Firms interact with other institutions is a range of ways; these include purchase of intermediate or capital goods embodying knowledge. The installation and operation of such new equipment is also knowledge creating. Then there is the

5 In much policy analysis it is common to use the terms 'high-technology' or 'knowledge intensive industries' in a somewhat loose way, as though in fact they are both meaningful and interchangeable terms. The term 'high technology' is a recent invention, and that its meaning is far from clear. The standard approach in this area rests on a classification developed by the OECD in the mid-1980s.The OECD distinguished between industries in terms of R&D intensities, with those (such as ICT or pharmaceuticals) spending more than 4% of turnover being classified as high-technology, those spending between 1% and 4% of turnover (such as vehicles or chemicals) being classified as medium-tech, and those spending less than 1% (such as textiles or food) as 'low tech'. But, the OECD discussion of this classification was rather careful, and offered many qualifications. Chief among these is the point that direct R&D is but one indicator of knowledge content, and that technology intensity is not mapped solely by R&D. Unfortunately the qualifications were forgotten in practice, and this classification has taken on a life of its own; it is widely used, both in policy circles and in the press, as a basis for talking about knowledge-intensive as opposed to traditional or non-knowledge intensive industries.

6 The Frascati Manual's definition of research, if taken seriously, would have to include things like market research, which often involve rather sophisticated social investigation. The development definition, on any reasonable interpretation, should include more or less all activities related to innovation. However the Frascati Manual contains a list of exclusions. All improvements in production processes are excluded from R&D. Engineering development and trial production may be R&D or may not - it is rather arbitrary. Trial production is included 'if it implies...further design and engineering'. Trouble shooting, patent and license work, market research, testing, data collection and development related to compliance with standards and regulations are all excluded. See about: OECD, Proposed Standard Practice for Surveys of Research and Experimental Development 'Frascati Manual' OECD, Paris, 1993

purchase of licences to use protected knowledge. Finally, firms seek to explore their markets. Given that innovations are economic implementations of new ideas, then the exploration and understanding of markets, and the use of market information to shape the creation of new products, are central to innovation. These points imply a more complex view of innovation in which ideas concerning the properties of markets are a framework for the recombination and creation knowledge via a range of activities; in this framework R&D is important, but tends to be seen as a **problem-solving activity** in the context of innovation processes, rather than an initiating act of discovery (Lundvall, B.A., S. Borras. 1997).

Relevant knowledge base for many industries is not internal to the industry, but is distributed across a range of technologies, actors and industries[7]. These inter-agent or inter-industry flows conventionally take two basic forms, 'embodied' and 'disembodied'. Embodied flows involve knowledge incorporated in to machinery and equipment. Disembodied flows involve the use of knowledge, transmitted through business cooperations, scientific and technical literature, consultancy, education systems, movement of personnel ect. The basis of embodied flows is the fact that most research-intensive industries (such as the advanced materials sector, the chemicals sector, or the ICT complex) develop products that are used within other industries. Such products enter as capital or intermediate inputs into the production processes of other firms and industries: that is, as machines and equipment, or as components and materials. When this happens, performance improvements generated in one firm or industry therefore show up as productivity or quality improvements in another. The receiving industry must of course **develop the knowledge, skills and competences to use these advanced knowledge-based technologies**. Competitiveness within 'receiving' industries depends heavily on the ability to access and use such technologies.

Agrifood industry is one of the largest manufacturing industries in all OECD economies, and certainly is one of the largest industries in Europe. Clearly many different kinds of skills, scientific disciplines and knowledge areas are involved in the functions and activities in this industry. The core knowledge areas of the food processing industry are food science, including food related chemistry, biology and physics, and food technology including biotechnology, electronics, instrumentation and engineering. Despite the fact that this is an industry with relatively low levels of internal R&D, it might well be claimed that this is one of the most knowledge-intensive sectors of the entire economy.

Intellectual capital performance measure - VAIC

In current economy the predominant activity is no longer the production of goods but the production of knowledge, which is then built into goods and services. This is the starting point of every further economical analysis. As far as capital is concerned, economic thought defines quite precisely what that implies. Capital is only the money or property - buildings, machinery, raw materials - that is used to create new value. The same kind of analogy can be done with knowledge. The power of knowledge still refers to its manifestation in the business environment, and that is **intellectual capital**. In the new economy the concept of intellectual capital is used as a synonym for that part of knowledge which is transformed into market value. From an economic point of view it is possible to conclude that only such knowledge becomes intellectual capital, that it is transformed into value identifiable on the market, or in other words, into benefits for the customer. As money, which doesn't serve the purpose of creating value, is not capital, in the same way isn't the knowledge that fails

7 A distributed knowledge base is a systemically coherent set of knowledges, maintained across an economically and /or socially integrated set of agents and institutions.

to fulfil the same function. Intellectual capital is the ability to transform and build knowledge into wealth creating goods. Because people are the main carriers of knowledge following the same logic as before, we can say that only these employees, who know how to use their knowledge in order to create value for themselves, their companies or society are human capital. If we all agree on the fact that employees are the key resource of 21.century and that knowledge is today what once were land and money, than it would be only logical to give this resource the status it deserves: to be investment and not cost any more (Pulic, A. 2000).

There has been growing concern with traditional performance measures since the shift from the Industrial Age to the new economic era based on knowledge. In the Industrial Age the measurement of systems were based on the notions of mass with a concentration on the number of units consumed in the creation of a product. Industrial Age measures of firm performance focus mainly on the financial criteria as the gauge for success. If a firm shows an increase in earnings, for example, this is generally seen as positive. As the underlying features of intellectual capital, namely knowledge and information technology, have replaced labour and capital as the driving production factors of wealth-creation calls for new measures have intensified. Under the new economic era of intellectual capital, the demand for customization has resulted in a shift to a focus on the relationship of resources used in the production of an item. Furthermore, the emphasis is now on the efficiency with which the relationship between the resources employed and the item produced are performed. This is not to say that the traditional value propositions of cost, quality and time have become redundant. Rather, measures that capture these notions are necessary but now longer sufficient for policy makers to make the best decisions on the allocation of scarce resources so as to meet the challenges of a new dynamic world.

The efficiency of value added methodology (VAIC) developed by Professor Ante Pulic is one intellectual capital based measurement system that offers to fill the expanding void evolving within the growing demand for better mechanisms to evaluate firm performance in the new economic era. Intellectual capital, consisting of two basic components, human and structural capital. The human capital of a company is represented by its workforce and, in accounting terms, by the expenditures for employees. As the quantity of products produced in a given time expressed the productivity of manual work, intellectual capital efficiency can be used as an expression of knowledge workers productivity.

VAIC is a valuable tool that can enable stakeholders to detect weaknesses and strengths in the value creation (Pulić, A. 2004). Developing an understanding of the value creation process is important for many stakeholders.

Value added and Efficiency Calculation

The business result is value added, which is calculated as the difference between output and input. The basic definition is as follows: **VA (**value added for company**) = OUT** (total Sales) **– IN (**cost of bought – in materials, components and services)

Human capital efficiency coefficient (**HCE)** is received as a result: **VA** (value added) **/ HC** (total salaries and wages for company)

Structural capital **SC** as the second component of IC is calculated as following:

VA (value added) **– HC (**total salary and wage duty's for company)

Structural capital efficiency coefficient (**SCE**) is calculated in the following manner: **SCE = SC / VA**

By adding up the partial efficiencies of human and structural capital the ***Intellectual Capital Efficiency coefficient*** (ICE) is obtained. **ICE = HCE + SCE**

Capital Employed Efficiency coefficient (**CEE**) is calculated in the following manner = **VA / CE (**book value of the net asset for a company)

In order to enable comparison of overall value creation efficiency all three indicators need to be added: **VAIC = ICE + CEE**

Where:

VAIC = value added intellectual coefficient
ICE = intellectual capital efficiency coefficient (HCE + SCE)
CEE = capital employed efficiency coefficient

This aggregated indicator indicates the overall efficiency of a company and indicates its intellectual ability. In simple words VAIC indicates how much new value has been created per invested monetary unit in each resource. For example if a VAIC value of 2.500 is reported, this can be interpreted as meaning that for every euro of resource employed 2.50 euros of value added is created. The interpretation of VAIC is quite simple. The limit values of indicators point to different levels of efficiency in value added creating and use of intelectual capital.

Efficiency	**Description of efficiency level**
2,50	(Or more) is the sign of highly successful business operations
2,00	It is the minimum for succesful conducting of business operations in most sectors (sufficient value is created to satisfy the needs of employees, depreciation, interests to banks, taxes to the state, dividens to owners)
1,75	Business operations are in a relatively good condition, but they do not guarantee a long-term security
1,25	The reason for concern, does not create enough to ensure development
1,00	The reason for serious concern, insufficient to satisfy all the inputs that are necessary for operational buisness activities

The higher the VAIC and ICE values the better management has utilized the existing potential in the resources employed in creating value. A certain efficiency level tells us how much investment in resources, financial and intellectual capital, is necessary in order to create a certain mass of value added.

The results of research and discussion

The analysis includes companies dealing within the main agricultural industry sub-groups: agriculture and food industry. The sample in the field of agriculture consists of 17 companies and the sample in the field of food industry includes 20 companies. The companies were selected according to the criterion of the total revenue amount, which represents one of the most traditional indices of successfulness of business operations. However, the accomplished high revenue does not automatically mean that company's business operations are efficient and profitable and that it creates added value.

The first column of Table 1 in Appendix represents the rank of companies in agricultural industry according to the realised total revenue, the second according to realised profit, the third according to value added amount, the fourth according to intellectual capital (IC) efficiency, the fifth

according to physical and financial capital (CEE) efficiency while the last column shows the rank according to efficiency of use of all resources, namely overall efficiency (VAIC). If the company failed to create added value, which is the precondition for calculation of other indicators, it has been omitted from further ranking.

Based on the available statistical data (Table 1) it can be noted that 17 companies from the sample of agriculture accomplished an exceptionally high total efficiency level (VAIC) of 8,48 on the average, as well as above the average level in intellectual capital (IC) efficiency of 7,46 and a high coefficient of property management (physical and financial resources) efficiency of 1.02. If we take into account that the level of the accomplished VAIC coefficient exceeding 2.5 represents the parameter of exceptionally successful business operations, the mean of the observed companies makes an excellent result. Ten companies contributed to such a high average total efficiency (VAIC) coefficient, which makes more than a half of the analysed sample. All of those ten companies reached the VAIC coefficient values that are considered above the average according to the parameters of this method and that point to exceptionally high efficiency in management of all company's resources.

According to the results of all indicators, the Company "Agroziv" takes the first place. In relation to other companies, Agroziv realised the revenue and profit that is above the average, as well as exceptionally high total efficiency (VAIC) coefficient, the value of which reaches even 74.05. Taking into account that the value of VAIC coefficient of 2.5 points to exceptionally successful business operations, this company is the example of excellence in business. It should be taken into account that Agroziv operates with only 49 employees while the average number of employees for the analysed 17 companies is 290. In other words, this company uses its human and intellectual capital in the most efficient way possible.

However, the Company PIK Becej – Poljoprivreda AD Becej confirms that realised revenue does not have to imply successful and efficient business operations. According to the realised revenue, it takes the second place; it did not record any profit in 2007; it takes the second place according to the value added indicator and according to total efficiency coefficient, it takes the 13th place (VAIC of 1.18). The reason for such unfavourable results of efficiency indicator is the fact that PIK Becej employs 2.241 people. The amount of created added value (the structure of which includes salaries of employees and depreciation because there was the negative difference between the revenues and expenses) is not sufficient for accomplishment of higher efficiency. Since the value of this coefficient is below 1.25, the company will not be able to ensure further development with such business operations.

The Company "POBEDA DOO Vladimirovac", which takes the 6th place, did not create the added value and it was therefore excluded from further analysis. This shows that total revenue cannot represent the indicator of successful business operations. For example, despite the fact that the Company "Agrar FM DOO Novi Sad" takes the 10th place according to total revenue it takes the 2nd place according to total efficiency coefficient with VAIC of 15.55, which makes the result exceeding the average. The Company "Visnja Produkt DOO Novi Sad" takes the 13th place according to realised revenue while it takes the 3rd place according to total efficiency coefficient with VAIC of 11.37.

Contrary to the companies Agrar and Agroziv, which owe their high total efficiency coefficient primarily to efficient intellectual capital (IC) management, the Company "Visnja Produkt DOO Novi Sad" recorded a high total efficiency rate thanks to expert physical and financial resources (CEE) management. Within the observed sample, out of 17 companies in total, there was one company – PIK Becej – that recorded the result showing that their business operations were in the

condition raising concern, which implied that they did not create sufficient value added to ensure further development, while the results of two companies - "Mitrosrem" and "Tehnooprema" – showed very poor condition of their business operations, which implied that their value added was not sufficient to cover all the inputs necessary for functional operations. In any case, the overview of efficiency of business operations of companies belonging to the analysed sample from agricultural sector provides a surprisingly positive picture of skills of our company in efficient management with their tangible and intangible assets.

The analysis of the rank matrix produced for the sample of twenty companies in food industry sector shows that the value of VAIC coefficient in those companies is much more balanced compared to the scope of deviations of VAIC coefficient values in companies from agricultural sector sample (see in Appendix Table: 2.) No extreme deviations can be noted, as in the case of "Agroziv", and maximum values of VAIC coefficient do not exceed the limit of 8.03,which is the highest coefficient value in the observed sample. Consequentially, the average VAIC coefficient value is much lower than the one in agricultural field and it makes 3.36. However, it is an excellent result since each value above 2.5 points to an above average efficiency in management with company's tangible and intangible resources. In the observed sample, out of 20 companies in total, 13 of them realised the value of the total efficiency coefficient that is above the average. Two companies did not create added value and they were excluded from further analysis. Two companies - "Vital AD Vrbas" and "Dijamant AD Zrenjanin" – with VAIC of 2.04 and 2.45 respectively, are on the border of successful business operations in the sense that they create sufficient amount of added value to cover the costs of employees, depreciation, interests to banks, taxes to the state and dividends to owners. Other three companies recorded the VAIC coefficient value below 2.00, which points to the fact that their business operations are in a relatively good condition although such business operations do not guarantee long-term security – as it is the case with the Company "Sunce A.D. Sombor", or in a poor condition raising concern since they do not create enough to ensure future development – as it is the case with companies "Neoplanta"and "Victoria Group".

The first place among this group according to total efficiency coefficient (VAIC) value belongs to the Company "Victoriaoil AD Sid". This Company employs 199 people, which is significantly below the average number of employees for companies belonging to the subject sample (579). It can also be noted that the Company recorded such high total efficiency primarily due to above average efficient management with its intellectual capital with the ICE coefficient value of 7.79. On the other hand, this Company takes the 13th place according to CEE coefficient value of 0.24, which points to the level of efficiency of management with physical and financial resources. According to the total revenue this Company takes the 11th place and it takes the 9th place according to realised profit, which points to the fact that revenues and profit as traditional success indicators for business operations are not sufficient to recognise successfulness and capacities of the company to allocate efficiently its tangible and intangible resources and manage them efficiently.

Conclusion

Based on the results obtained in the analysis of the sample of companies in agri food sectors we can conclude next:

The average value of VAIC coefficient of companies in both of the observed samples falls above the value of 2.5 and that points to the fact that most analysed companies manage their tangible and intangible resources efficiently. If we consider the overall rank matrix, we can see

that intellectual capital efficiency is crucial for overall success since there is a higher matching between the rank lists according to ICE and VAIC indices than according to CEE and VAIC indices. Thus, this analysis confirmed that intellectual potential in business operations of the analysed companies is a significant element for generating overall success of their business operations. Such a high success indicator of business operations in 2007 can be explained with tradition, experience, intensive human capital use, and their good positioning at domestic and foreign markets. However, such high values of IC coefficient in the selected companies should still be accepted with reserve. (Because analysed data is only for one year/ 2007)

The results of the analysis also show that the amount of revenue and profit is not mandatory the sign of efficiency in use of resources. That is because the companies that ranked among first ten (within two observed samples) according to VAIC coefficient also include companies that are according by total revenues ranked in the middle or near the bottom of the scale. Emphasising smaller companies that were not ranked as the most successful according to quantitative indices, the analysis confirms the applicability of VAIC in providing a clear picture on qualitative aspect of business operations of companies within the observed period.

At the end, Authors of this paper would like to point at importance for further studying the role of knowledge in agrifood sector and continuous and systematic measuring of its IC potential for value creation.

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APENDIX

Table 1 - Rank matrix of companies in agricultural sector according to realised revenue, value added, and all VAIC resource use efficiency indicators in 2007

Revenue	Profit	VA	ICE	CEE	VAIC	Name of the company	Revenue	Profit	VA	ICE	CEE	VAIC
1	1	1	1	1	1	AGROZIV AD PANČEVO	13.046.933,00	1.306.381,00	1.492.933,00	66,21	7,833	74,05
2	0	2	13	10	13	PIK-BEČEJ,POLJOPRIVREDA AD BEČEJ	3.650.833,00	0,00	903.027,00	0,91	0,264	1,18
3	0	0	0	0	0	FARME PILIĆA DOO ZITIŠTE	2.066.449,00	0,00	0,00	0,00	0,000	0,00
4	0	3	14	13	14	IMITROSREM AD SREMSKA MITROVICA	1.780.092,00	0,00	408.383,00	0,27	0,185	0,46
5	4	10	3	3	4	ULJARICE-BAČKA DOO NOVI SAD	1.739.083,00	60.634,00	74.378,00	7,41	0,924	8,34
6	0	0	0	0	0	POBEDA DOO VLADIMIROVAC	1.521.920,00	0,00	0,00	0,00	0,000	0,00
7	5	7	6	9	6	SAVACOOP DOO NOVI SAD	1.473.412,00	68.402,00	81.120,00	6,10	0,353	6,45
8	11	14	9	7	9	MILENIJUM ZADRUGA BANATSKO NOVO SELO	1.366.107,00	9.995,00	24.707,00	3,07	0,426	3,50
9	2	4	7	11	7	AGROUNIJA AD INĐIJA	1.160.717,00	210.161,00	392.536,00	4,74	0,195	4,94
10	3	9	2	4	2	AGRAR FM DOO NOVI SAD	1.124.921,00	68.637,00	75.796,00	14,84	0,713	15,55
11	9	15	8	8	8	POLO DOO VRSAC	1.089.207,00	12.736,00	23.638,00	4,21	0,406	4,62
12	0	13	15	14	15	TEHNOOPREMA DOO ZRENJANIN	918.975,00	0,00	40.485,00	0,00	0,181	0,18
13	7	12	5	2	3	VISNJA PRODUKT DOO NOVI SAD	635.255,00	37.988,00	51.551,00	6,94	4,425	11,37
14	6	8	4	5	5	RAN-KOMERC DOO SUBOTISTE	541.591,00	55.024,00	80.526,00	7,40	0,669	8,07
15	12	5	12	6	12	GRADSKO ZELENILO JP NOVI SAD	493.262,00	5.846,00	317.125,00	1,12	0,549	1,67
16	8	6	10	12	10	JUZNI BANAT AD BELA CRKVA	486.547,00	21.211,00	152.192,00	1,90	0,187	2,09
17	10	11	11	15	11	SEME-TAMIS AD PANČEVO	461.955,00	11.445,00	67.579,00	1,70	0,089	1,79

Table 2 - Rank matrix of companies in food industry sector according to realised revenue, value added, and all VAIC resource use efficiency indicators in 2007

Revenue	Profit	VA	ICE	CEE	VAIC	Name of the company	Revenue	Profit	VA	ICE	CEE	VAIC
1	3	5	3	14	3	SOJAPROTEIN AD BEČEJ	14.251.169	1.075.896	1.566.111	5,35	0,24	5,59
2	1	1	10	8	10	APATINSKA PIVARA AD APATIN	11.680.956	1.633.292	4.486.819	3,11	0,42	3,53
3	10	8	13	11	14	DIJAMANT AD ZRENJANIN	9.004.861	401.416	1.506.469	2,16	0,29	2,46
4	2	4	2	6	2	IMATIJEVIĆ DOO NOVI SAD	6.909.738	1.293.768	1.811.001	5,57	0,51	6,08
5	17	18	17	18	18	VICTORIA GROUP DOO NOVI SAD	6.693.286	6.319	147.086	1,40	0,11	1,50
6	5	6	8	7	9	CRVENKA AD CRVENKA	6.046.786	810.062	1.552.209	3,24	0,43	3,68
7	6	3	7	1	7	CARLSBERG SRBIJA DOO ČELAREVO	5.808.764	684.900	1.898.603	3,27	0,59	3,86
8	4	7	4	9	4	NEKTAR DOO BAČKA PALANKA	5.679.146	906.024	1.529.262	4,98	0,38	5,36
9	16	15	16	10	15	VITAL AD VRBAS	5.387.320	24.353	667.677	1,70	0,34	2,04
10	7	2	14	4	13	CARNEX AD VRBAS	5.317.939	606.696	2.040.930	2,00	0,56	2,55
11	8	11	1	13	1	VICTORIAOIL AD SID	4.750.893	529.627	760.601	7,79	0,24	8,03
12	13	14	9	2	8	TE-TO AD SENTA	4.611.081	216.048	604.525	3,24	0,59	3,83
13	9	9	5	3	5	SAJKAŠKA AD ZABALJ	3.093.984	607.727	860.880	3,99	0,68	4,67
14	11	10	11	16	12	IM LEKARA AD SUBOTICA	2.931.606	396.761	868.189	2,96	0,24	3,20
15	12	12	12	5	11	SOMBOLED DOO SOMBOR	2.896.919	296.071	706.632	2,85	0,52	3,37
16	18	13	18	15	17	NEOPLANTA AD NOVI SAD	2.692.560	-	617.929	1,29	0,24	1,53
17	15	16	15	17	16	SUNCE AD SOMBOR	2.478.562	44.128	462.368	1,81	0,16	1,97
18	0	0	0	0	0	PIVARA MB DOO NOVI SAD	2.411.166	-	-	-	-	-
19	0	0	0	0	0	AGROZIV-YUKO DOO ZITISTE	2.166.576	-	-	-	-	-
20	14	17	6	12	6	BANAT AD NOVA CRNJA	1.920.617	149.775	331.233	3,81	0,29	4,10

CROSS-BORDER COOPERATION, PROTECTED GEOGRAPHIC AREAS AND EXTENSIVE AGRICULTURAL PRODUCTION IN SERBIA

Zaklina Stojanovic[1], Emilija Manic[2]

Abstract

The concept of Sustainable Agricultural and Rural Development (SARD) is based on resources effective usage that brings strengthen social cohesion of rural regions. Sustainable agro systems take care of natural resources conservation, as well as of economic and social aspects of rural economy. In order to advance complementary activities, agricultural sector has been often seen as the base for local economical diversification of capacities. The connections between agriculture, nature and tourism are especially important. The EU countries insist on this kind of connections which is the integral part of financial support of common funds, while the candidate countries are using the IPA assistance for rural development programs. Program of cross - border cooperation has been placed within this context, too.

The article, also, gives several examples of cross-border cooperation project that might include Serbia with some of the neighboring countries in the area of tourism and rural development. The most important elements of cooperation with comments and issues from the author's perspective of view are given in this paper.

Key words: multifunctional, extensive agriculture, SARD, cross-border cooperation, rural tourism, ecotourism, Serbia.

1. An introduction

The concept of Sustainable Rural Development means three aspects – social, economical and ecological. They suppose to act in synergy, but, at the same time, these aspects suppose to be in the concurrent opposition. Agriculture, as a traditional activity of rural economy, contributes to the sustainable development of rural areas only if there is adequate resources management. If not, there will be significant degradation of rural environment. These are the reasons why sustainable agriculture development is being emphasize, through which the productivity is maximize, and the negative effects on nature and human resources are minimize. In this context, the connection between agriculture and tourism exists, where this application of sustainable agricultural development concept produces extern effects connected to biodiversity protection and environment in rural areas.

On agreed and mutually accepted principles is based EU cooperation. The new member countries and candidates for membership are though the process of association and stabilization accepting and incorporating those principles. Through numerous programs of cross-border cooperation European Union supports them. In the area of tourism development in bordering protected areas, which includes both development of tourism promotion and development of complementary activities, special interest have been shown. In the areas of protected natural environment, cultural and historical

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heritage, especially interesting aspect is fitting rural development with creation of integral tourist offer. Republic of Serbia has numerous protected natural and cultural areas. Some of them are in border areas to neighboring countries. Taking into account options that EU IPA funds offer for joined projects of cross-border cooperation, tourism and rural development of those areas becomes very important factor of their overall economic growth.

2. Rural and eco-development

Sustainable development is development that satisfies the needs of present generations without jeopardizing the ability of future generations to meet their own needs is interpreted. As such, it comprises different aspects of sustainability – social, economic and ecological, which can, to a certain extent, develop synergy, but also be mutually unsupportive, that is, competitive in their accomplishment. The social dimension implies creating a satisfactory level of rural employment and enabling the quality of life in rural areas. The economic dimension of sustainability refers to diversification of rural economy leading towards efficient resource exploitation, competitiveness of rural areas and vitality of integral rural economy. The ecological dimension of sustainability refers to preservation of resources (natural, human and manufactured) in order to satisfy the needs of present and future generations in an adequate way. This aspect of sustainability was first discussed in the sense of rational usage of limited resources, but today, within the dimension of sustainability, there is more and more talk about external effects of different activities in rural areas connected to protection of countryside, habitats, biodiversity, as well as quality of water and air (*Tietenberg T., 2006*).

Agriculture plays a special role in the development of the SARD concept as the traditionally present activity of rural economy. Natural, human, manufactured, financial and local resources are all engaged in agricultural production. By means of politics, procedures and institutions, these resources are transformed not only into food as a visible product, but also into employment, welfare of local community, clean air, healthy environment, reduced crime rate in rural areas, strengthening of social cohesion et al. If resources are not managed adequately, it is possible that there occurs a degradation of the basis for rural economy development, which is most often seen in the form of depopulation of rural areas, uncontrolled forest cutting, soil and water pollution. Sustainable agro systems contribute to strengthening of positive effects on resources, thus contributing to the increased possibility to serve by their own activities to the accomplishment of needs of future generations (*James R. Kahn, 1998*). In the context of the connection between agriculture and the concept of sustainable rural development it is often emphasized that farmers exert significant influence on local, national and international economics and ecosystems – a positive or negative one. In the era of modernization of agriculture, special emphasis is on growing danger of losing biodiversity, and that is the reason why traditional farmers (the so-called rural world) are marked as guardians of natural environment. Experts of different profiles, dealing with analyses of agricultural production, all agree nowadays in saying that agro-sector provides a unique public service which no other economic sector can provide.

Sustainable agriculture is based on using technologies that maximize productivity and at the same time minimize the negative effects on natural (soil, water, air and biodiversity) and human resources (rural population and consumers). By finding the way to use resources most efficiently, sustainable agriculture leads towards strengthening of social cohesion – trust in partnership between the institutions on the local level. Not without reason, it is considered today that only agro systems of this kind (based on highly valued human and social resources) are also sustainable in the long run. The concept of sustainable agriculture was extended in 1989, and today it comprises sustainable agricultural and rural development (SARD). In that sense, SARD is defined as a concept of "management and preservation of natural resources and directing of technological and institutional changes in such a way as to enable achievement and continuous satisfaction of the needs of present and future generations. Such a development preserves soil, water, plant and animal resources, does not degrade the environment,

it is technically convenient, economically proper and socially acceptable." (*Jovanović Gavrilović B., 2004*). It should be mentioned that the concept of multi-functioning and sustainability of agriculture and rural development have a common basis. Both concepts rely on multidimensional conceptualization of the role of agriculture which yields market and non-market results. Still, there is also an important difference between the afore-mentioned concepts. While sustainability insists on the efficient way of resource usage, multi-functioning is oriented towards analyzing the multiple product of agricultural activity (food, external effects and public goods) which deserves a more significant support of the so-called green box measures of agricultural budget. Agriculture is nowadays viewed as a basis for diversification of local economic capacities, in the sense of promotion of complementary activities. It is especially talked about the connection between agriculture, protection of plant and animal resources, intact nature and ecotourism.

3. Specific areas in Serbia applicable for the eco-rural-tourism cross-border programs

Through cross – border cooperation projects many aims could be reached, among which one of the leading places takes the aspiration for promotion of sustainable economical and social development in border regions. Knowing that these regions are usual passive and undeveloped, the projects of cross – border cooperation could induce development of those activities in local economy which could bring better living condition and economical prosperity on one hand and protection of environment, on the other. Examples of this kind of projects in Serbia are usually in rural and ecotourism development in specific areas with geographic protection.

Map 1 - Protected areas in Serbia, neighboring countries and cross-border cooperation projects

Analysis is addressed to a Program perspective application in agriculture and tourism development (rural and eco tourism) based on different examples of cross – border cooperation between Serbia and EU or EU candidate countries. This kind of cross - border cooperation would mean common investments in infrastructure, space organization, protection of environment and joint presentation of tourist products and tourist offer on third markets.

Differences in natural resources and cultural heritage in border region in Serbia could be used in the development programs of these parts of the country: (1) Spatial nature reservation of «Upper Danube» region between Serbia, Croatia and Hungary; (2) Old Mountain between Serbia and Bulgaria; (3) «Djerdap» between Serbia and Romania. These projects would suppose development of ecotourism and rural tourism with joint action between economy and ecology, and through which the standard of local communities would be upraised and border region would be in position to develop faster.

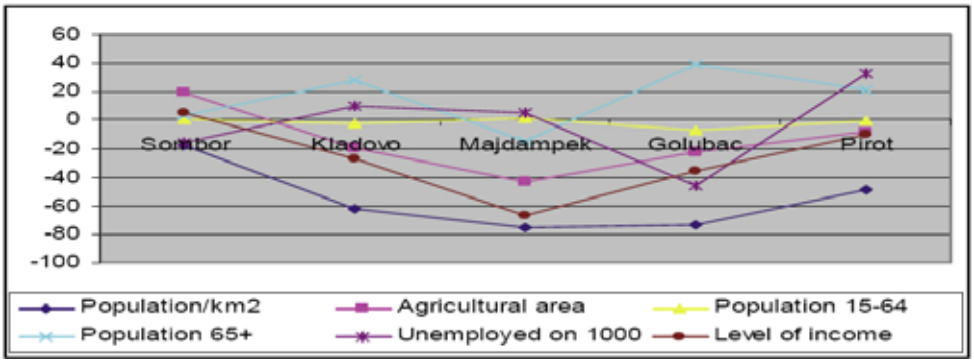
Table 1 - Observed municipalities - general data

Municipalitiy	Area	Population (2002)	Population change (2002-1991)
Sombor	1.33	1.32	3.00
Kladovo	0.71	0.3	-11.20
Majdampek	1.06	0.29	-11.60
Golubac	0.42	0.13	-8.50
Pirot	1.39	0.83	-4.60
Total	4.91	2.87	-1.00

Soruce: Municipalities in numbers, Statistical Office of Serbia 2008.

The analysis is based on the different indicators of agricultural and rural economy development in specific areas chosen for the research. General data, vital statistics and both eco and economic indicators shows that chosen border municipalities are mostly overwhelmed with different kind of developmental problems – underdeveloped economy, unemployment, dominantly share of the primary sectors activities in GDP, significant share of elderly in total population ect. (Table 1, Graph 1). In others regions in Serbia, especially in region of Vojvodina under intensified agricultural production, there is degradation of soil or reduced biodiversity. According to Health Statistical Yearbook 2007, Zapadnobacki district (Sombor) had 2 times higher percentage of water samples noncompliant with Rulebook (physical-chemical safety), while Borski district (Majdampek and Kladovo) was on average for Serbia (19,87%), Branicevski district (Golubac) was two times lower and Pirotski district (Pirot) counted almost non significant water pollution at level 0,63%. Underdeveloped economy brought an important advantage – non polluted environment and perspective for rural sector development throughout ecotourism and extensive agricultural production especially to South region. Further analysis is addressed on specific regions of Serbia applicable for cross-border eco/rural tourism programs.

Graph 1 - Observed municipalities selected data (Average for Serbia = 0)



Source: Municipalities in Serbia, Statistical Office of Serbia 2008

a) Case study I - Cross border cooperation in the area of Special nature reservation „Gornje Podunavlje"

Special nature reservation "Gornje Podunavlje" is very interesting for creating cross border cooperation in area of tourism development, especially rural and ecotourism between three countries, Serbia, Croatia and Hungary. It is located in western part of Bačka and is a part of the largest swamp area in Europe. Pan European transport corridor 7 intersects with this area, which creates favorable conditions for cooperation and affirmation. All three countries introduced protection of this area, in Serbia it's Special nature reservation (SNR) „Gornje Podunavlje", in Croatia it's Nature park „Kopački rit" and in Hungary it's National park „Danube – Drava". Diversity of nature, specific folklore elements, local architecture and location on the junction of border regions, are strong stimulus for establishment of cross border cooperation, especially through the tourism development programs and joined entry on other markets. The fact that given area is rural, tourism can be very important pull factor for development of other complementary activities, like agriculture and organic food growth. All three countries have recognized this potential and incorporated these ideas in some of their development documents (*NICEF, 2007*).

So far each country have been individually working on tourism development in these areas, with modest attempts to achieve cross border cooperation with one of neighboring countries their; none document identified any attempt of three parties cooperation of Serbia, Croatia and Hungary. Considering Serbia, tourism development in area of SNP "Gornje Podunavlje" is described in Master plan of "Tourist area Gornje Podunavlje" with focus on utilization of biodiversity, nautical potentials on Danube, swamps, channels, pastoral nature and surrounding rural areas (*Stojanović Ž., Manić E., 2009*). This document clearly identifies elements that will be the foundation for building tourism offer of this area: preserved nature, magical rivers, plain landscape and rural settlements – salaši. Good accessibility, dispersed attractions and infrastructure modeled those elements in two basic tourist products - recreational and rural tourism, but still without differentiated ecotourism products.

In the Nature park „Koparački rit", Croatia has developed ecotourism products, such as residing at biological station, seminars organization, birds watching, photo-safari, as well as standard tourism products, such as recreational fishing, excursions to typical local farms, visits to Zoo or to Tikveš castle. Additionally, Croatia has already been involved in cross border cooperation with Hungary trough project of Euroregional cooperation „Dunav – Drava – Sava", together with Bosnia and Herzegovina, while Serbia has observer status (*www.crp.org.ba*). During the period 2000-2002, municipallities from this area had joined presentations on tourist fair events. But, this cooperation

didn't lead to creation of joined integral tourist product, which would unite all thee protected areas.

Still, there are some aspects of the cross- border cooperation in the area. Serbia and Hungary have over 40 years history of cross-border cooperation between brotherly cities of Sombor (Serbia) and Baja (Hungary) in various areas. Unfortunately this cooperation still doesn't include tourism development. Only attempt in this direction is joined city guide of those cities, published in 2007. (*RASMSE, 2007*).

Cooperation of Serbia and Croatia in area of joined tourism product development and joined presentation on other markets is still very modest. Only one joined project has been realized so far: Bicycle tour "Panonian peace route" between cities of Sombor and Osijek. This project has been supported by non governmental organizations CRS and USAID, as well as cities of Sombor and Osijek. Bicycle tour that connects two cities is 80 km long and goes through protected areas SNP „Gornje Podunavlje" and Nature park „Koparački rit". Project has been realized as part of much bigger project "Development of cross border tourism on the Middle Danube", financed by EU through "CARDS 2004" program. The goal of the project was Middle Danube region sustainable economical, social and tourist development. In that context we can monitor development of agriculture and countryside life, as an important part of the integrated tourist product.

b) Case Study II - Cross border cooperation opportunities between Serbia and Bulgaria in the area of Old Mountain

An interesting area for development of rural and ecotourism though cross-border cooperation is Southeastern Serbia, Pirot and Dimitrovgrad municipalities, which partly reside on Old Mountain area. Along the crest of Old Mountain is the border between Serbia and Bulgaria, which is seen in the future as a factor that connects tourism development of two countries in this area. Additional integration factor is the fact that these municipalities populate significant number of Bulgarian national minority members. Pirot and Dimitrovgrad are only around 60 km away from Bulgarian capital city Sofia, which is also very important factor for planning tourist offer and directing marketing activities.

Both municipalities have exceptional preconditions for ecotourism development. On Serbian side of Old Mountain, Strict Nature Reservation is established with a goal to protect numerous autochthon plant species, endemism, rare birds and venison. Additionally, Jerma canyon and valley of the river Temštica are protected as nature areas. This opens opportunity for organization of ecological schools, as well as performs classic eco tours. Numerous villages, such as Dojkinci, Brlog, Rsovac and Topli Do, with specific architecture, folklore and traditional handicrafts, give great opportunity for rural tourism development. Village households, local colors, dialect and authentic landscape are giving special flavor to the tourist offer of this area (*Gligorijević M., Devedžić M., 2006*). On the other side, Bulgaria has been doing much more in the area of rural tourism development. This fact can be significant booster for cross border cooperation (*Radovanović M., Bjeljac Ž., 2004*).

So far there have been some contacts between municipality of Pirot with neibouring Bulgarian municipalities, having simmilar folclore elements and handcrafts, but no specific project have been started in the area of tourism. Some joined projects supported bu EU exists, but their focus is on local government improvement and economic development as a whole. During a few last years, Serbia has started project of forming Ski center „Old Mountain", that can positivelly impact

development of tourism, including ecotourism and rural tourism, as well. One of the project tasks is creation of cross border cooperation with Bulgaria.

c) Case Study III - National Park "Djerdap" and neighboring countries cross border cooperation

National Park "Djerdap" is the biggest national park in Serbia and one of the richest with natural and anthropogenic tourist resources. National park area is located over significant part of three municipalities' territory: Golubac, Majdanpek and Kladovo. Additionally area protected by law includes big parts of few more neighboring municipalities. National park has vast of floral and animal diversity and it territory is significantly preserved from human influence. There are intensive ongoing activities in forming ranger service with aim to contribute to the National park preservation. Numerous monuments demonstrate rich cultural and historical heritage, which give additional value to the area. Finally, Danube as important European transport route, gives a special connection of this area to the rest of Europe.

Danube is also a country border with neighboring Romania and as such is seen as an important integration factor for cross-border tourism development. On the other side of National Park "Djerdap" and country border, we have National park "Iron gate" in Romania, also rich with various natural resources. This fact opens opportunity to unite protected areas which are combined with it's location on major transport route and all that give an excellent predisposition for creation of joined integral tourist product that can be offered on other markets.

At the moment there are two regional cooperation projects ongoing with participation of Majdanpek municipality from Serbia and city Turn-Severin from Romania. First project "Danube without borders" is leaded by Tourist organization of Majdanpek and Pro Mehedinci from Turn-Severin and has budget of 70.800 EUR. Project goals are joined promotion of tourist offer from both sides of border, mapping tourist resources, making joined publications, participation on tourist fairs and providing equipment for tourist offices in Donji Milanovac and Turn-Severin *(Severineanu R.S., Mirela M., 2007).*

Second project "United tourist destination Djerdap" is leaded by Tourist organization of Majdanpek and Turn-Severin municipality. Project goals are creation of joined promo material (film, catalog and map) and equipping both municipalities' info centers (the budget for this project is 165.000 EUR). Both projects are seen as basis for future applications to EU IPA funds.

One more cross border project is ongoing that has focus on tourism development in the area, with participation of Serbia, Bulgaria and Romania. Active participants in this project are municipalities of Majdanpek, Kladovo and Bor from Serbia, Vidin municipality from Bulgaria and Mehedinti district from Romania. Project goals are tourism development, creation of united integral tourist offer and uniting this area in one Euro region. They have an intention to produce several tourist products established on numerous tourist resources in those countries: speleological tourism, cultural tourism and sport events (including events on Danube). Tourism development requires significant investments in local infrastructure, agriculture, handcraft and ecology. Promotion and protection of natural and anthropogenic values in this area will contribute to tourism development, overall economic growth and improved cross border cooperation, resulting with sustainable development of whole area. Considering that in those municipalities and district dominate rural population with one urban center, this kind of cross-border cooperation would contribute to the rural development and its better overall integration in the whole Euro region.

4. Conclusion

Sustainable development considers three equally important components – economic, social and ecological. When we speak about sustainable development in the rural economy and tourism, we refer to all these elements. This research pointed out that underdeveloped economy brought an important advantage – non polluted environment and perspective for rural sector development throughout ecotourism and extensive agricultural production, especially to South region of Serbia.

The examples that are presented in the text confirmed common interests between sustainable, eco-rural development and cross-border cooperation programs. The projects that are being developed in Serbia in this area represent good foundation for future, much more fruitful cross-border cooperation in the area of tourism development, especially in protected areas, as well as in the agriculture and rural areas. Such projects would lead to investments in infrastructure, coastal areas regulation of the rivers, as well as presenting the integral tourist product on the third markets. Diversity of ethnical and national characteristics, as well as nature beauties is elements that should be utilized and offered on international market. Additional stimulus in this direction could be Cooperation Memorandum that signed Institute for Nature Protection of Serbia and International Union for Conservation of Nature (IUCN), which includes opening an IUCN office for Southeastern Europe in Belgrade. This cooperation will open new opportunities for cross border cooperation in area of nature protection, establishment nature parks in border areas we mentioned, but also in other, such as Mountain Prokletije (Serbia and Albania) and Šar Mountain (Serbia and FYR Macedonia).

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INNOVATION AND RURAL DEVELOPMENT: THE SOLUTION FOR THE HUNGARIAN BEE-KEEPING SECTOR

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Abstract

Rural development has become more and more important issue in Hungary since rural areas also contribute to the efficiency of the national economy. Development of rural areas also very important issue in the European Union, which could contribute to the improvement of profitability of small family businesses, higher employment rate in rural areas as well as slow down the migration of people from rural into urban areas.

Nowadays the bee-keeping - as one of the activities can provide alternative income for small businesses in rural areas – has become more and more important topic in Hungary. Bee-keeping sector provides income roughly 15 thousands families in Hungary. At the same time it takes important role in the preservation of rural landscape, traditions and their regional values. However, the sector has serious problems, as well (for instance quality issues, competitors on the market, etc.). It can be stated that the market position of Hungarian honey can be preserved through the improvement of quality assurance and product development. These developments can be carried out by the utilization of national and European Union funds.

Key words: honey production, EU funds, product innovation, rural development

Objectives

This paper's objective is to analyze how the bee-keeping sector could contribute to the development of rural areas and provide income for people living there. The paper analyzes regarding the world and European Union trends of honey production and consumption, but draws the conclusions regarding the living conditions of Hungarian rural population.

Honey production in the European Union

Worldwide production of honey amounts to around 1.4 million tonnes. The EU is an important producer of honey, in terms of production volume. In 2006, EU production of honey amounted to almost 200 thousand tonnes, accounting for approximately 14% of the global production. Other leading producers according to their production shares are China (22%), the USA (6%), Argentina (6%) and Turkey (5%).

The EU is accounting for around 14% of the global honey production. A large part of this growth was realized in Eastern Europe, notably in Hungary and Poland. The new member states of Romania and Bulgaria also significantly increased their honey production. Due to the accession of these countries to the EU, the self-sufficiency rate of the EU increased by almost 10%, to approximately 60%.

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The EU27 imported honey worth Euro 348 million in 2006. Developing countries together supply almost half of the EU's total honey imports. Imports fluctuated significantly between 2002 and 2006. This was due to large price increases as a result of import bans on honey from several countries, such as China and Brazil. These bans have been lifted again, because the worldwide supply of honey is decreasing and is resulting in high price increases.

The EU produces mainly polyfloral honey. The main monofloral honey that is produced in the EU is Acacia honey, as the black locust tree from which it is obtained is widely planted in Europe. The main producers of Acacia honey in Europe are Hungary, Bulgaria and Romania, although it is also produced in other EU countries. Other types are: linden blossom, heather, lavender, rosemary, orange blossom and sunflower honey. In Table 1 is presented the honey production of the individual EU member states.

The leading EU honey producers are Spain, Germany and Hungary. Production in Germany decreased by 5 per cent annually on average between 2002 and 2006, which was caused by a decreasing number of beekeepers and bee colonies. On the other hand, the production in Hungary increased in the same period. Overall, East European countries show a large average annual increase between 2002 and 2006. South European countries also show some surplus in production, for example Italy and Portugal. The Baltic States as well as the Nordic countries are very small honey producers, due to the cold climate. Although it does not yet appear from the statistics, the global honey production is currently decreasing because of the collapsing bee colonies, the so-called Colony Collapse Disorder. All big honey producers have been affected. This honey shortage resulted in an increasing honey price, and major importers are looking for other sources, such as Africa. Therefore, the future honey production in the EU is difficult to predict.

Table 1 - Honey production in the EU-27, 2002-2006, in thousand tonnes

	2002.	**2004.**	**2006.**	**Annual change**
Spain	32.0	32.0	n.a.	0 %
Germany	26.0	24.0	21.0	-5 %
Hungary	13.0	22.0	20.0	11 %
Romania	13.0	17.0	18.0	8 %
Poland	9.0	12.0	16.0	15 %
Greece	14.0	15.0	n.a.	7 %
France	16.0	14.0	n.a.	- 12.5 %
Italy	10.0	7.0	13.0	7 %
Bulgaria	7.0	11.0	n.a.	57 %
Austria	8.0	7.0	6.0	-7 %
Portugal	4.0	7.0	6.0	11 %
Czech Republic	6.0	n.a.	n.a.	n.a.
Slovakia	3.0	3.0	4.0	7 %
United Kingdom	3.0	8.0	4.0	7 %
Sweden	3.0	3.0	3.0	0 %
Denmark	2.0	3.0	n.a.	50 %
Finland	2.0	2.0	n.a.	0 %
Belgium	2.0	2.0	n.a.	0 %
Lithuania	1.0	1.2	1.3	7 %
Latvia	1.0	0.6	0.9	-3 %
Estonia	0.0	0.5	0.6	60 %

	2002.	2004.	2006.	Annual change
Luxembourg	0.1	0.1	n.a.	0 %
Ireland	0.1	0.1	n.a.	0 %
Netherlands	0.1	n.a.	n.a.	n.a.
Malta	0.1	0.0	0.0	-100 %
Slovenia	n.a.	n.a.	n.a.	n.a.
Cyprus	n.a.	n.a.	n.a.	n.a.

Source: CBI, 2008.

The 1221/97 EU regulation, which lays down rules for the implementation of measures to improve the conditions for the production and marketing of honey in the European Union. This objective is achieved through national programmes, which include measures in the field of technical assistance, control of varroasis, rationalisation of transhumance, restocking hives and applied research in the field of beekeeping and apiculture products (CBI, 2008)

Honey production in Hungary

Hungary is one of the largest EU producers of natural honey, with production amounting to 19.7 thousand tonnes in 2006. A comparable producer is Romania, with a production of 17.7 thousand tonnes. Between 2002 and 2006, production in Hungary increased by 11 per cent annually on average. Hungary has around 15 thousand beekeepers, of which 5 thousand are hobbyists. Together they produce 15-20 per cent of the honey in Europe. The largest part of it is exported, mostly to West European countries. Only around 5 thousand tonnes is produced for domestic consumption. The most famous honey in Hungary is Acacia flower honey, of which Hungary produces around 10 thousand tonnes a year. About two thirds of the acacia trees in Europe grow in Hungary. Another Hungarian specialty is silkweed honey, which has a strong and spicy perfume and flavour. Other Hungarian honey comes from sunflowers, fruit trees, and rape. EU countries are losing honey bees at high rates. The bee losses in Hungary are small at the moment compared to other EU countries, amounting to 10-15 per cent of the total honey bees.

Hungary produces far more honey than it consumes, and is therefore able to supply its own market. Moreover, Hungary is only a small consumer of honey and the consumption decreased during the review period. - As Hungary is the largest EU producer of honey, supplying the West European market, Hungary is a strong competitor to developing country exporters. The production of beet sugar in Hungary also fulfils the domestic market demand. The Hungarian sugar refineries are owned by large international sugar companies. However, as in many other EU countries, the sugar production is decreasing due to the sugar regime reform, which could provide some opportunities for exporting cane sugar to Hungary in the coming years. Moreover, as no cane sugar is produced in Hungary, this niche market could be addressed, although the current market is expected to be small (CBI, 2008).

EU funds for rural development in Hungary

Experts' opinion is that agriculture will play important role even in the future in providing income for people living in rural areas as well as in solving social problems. Generally it can be stated that smaller the village, the importance of agriculture for people living there is more important. That is why the importance of agriculture in the economy and its increasing strategic role (such as healthy food production, landscape management, agricultural environmental protection) is quite

evident (CSETE-LÁNG, 1999). The New Hungary Rural Development Programme set up four priorities that can be supported from the European Agricultural and Rural Development Fund.

These priorities are, as follows:

- Improving the competitiveness of the agricultural and forestry sector
- Improving the environment and the countryside
- Quality of life in rural areas and diversification of the rural economy
- LEADER programme, (Source: I3)

The ongoing financial period of the European Union (2007-2013) provides 5 billion EUR, roughly 1300 billion HUF EU support for the development of agriculture, rural environment, and regional development. The aim of the New Hungary Rural Development Programme is the creation of an agriculture that is competitive as well as ensures sustainable development in addition to strengthening market approach (I2).

Support to the bee keeping sector

Allocation of EU funds for investment in the bee-keeping sector is not as prominent as in other sectors such as cattle, pig and poultry sectors that are in compliance with the EU meeting standard measure. The bee keeping sector aims at focusing on supporting the establishment and operation of producer groups, as eligibility criteria of this measure are identical for all sectors.

Bee-keeping is significant in the following priorities:

- National Agri-environment program
- Alternative land use
- Production of bee pasture plants
- Rules of ecological animal keeping
- Bee-keeping
- Afforestation of agricultural lands
- Additional clauses eligible for support
- Establishing of subsidiary bee-keeping development forests

The Hungarian Bee-Keeping National Programme supports the sector to utilize the favourable conditions of the country thus improves its competitiveness and development. It results in economic benefits on the one hand, while on the other hand it is important in the maintenance of ecological balance and variability. Strengthening the social role of Hungarian apiary is very important, since it contributes to the economic development of rural areas, provides healthy and excellence quality apiary products for the population, and also ensures pollination by honey-bees. It would be very important to strengthen the cooperation within the apiary society and to implement new methods and tools, which contributes to business oriented farming of these people (I1).

Utilisation of the supports for bee keeping sector in 2008/2009 provided by the Hungarian Bee-Keeping National Programme can be seen in Table 2. Total sum of the subsidisation in 2009 is 3.940.000 EUR (1.051.073.800 HUF).

Table 2 - Utilisation of the supports for bee keeping sector in 2008/2009

Identification of support	Utilisation (in %)
National coordination of beekeeping training	77,01
Regional events, international seminars, conferences	74,54
Extension service	78,09
Practical training	65,35
Purchase of equipment regarding honey production	109,69
Purchase of new equipment	2,00
Medical protection against varroa acarus	71,85
Alternative protection against varroa acarus	97,88
Identification of hives and beekeeping accessories	100,83
Rationalization of migrant bee keeping, utilization of bee pastures according to seasons	81,21
Analysis of honey	112,62
Keeping numbers of bee colonies	0,00
Studying nosema disease	18,13
Building up meteorological bee observation network	100,00
Monitoring of the health of bees and environmental impact	87,63
Total:	**92,00**

Source: Kristóf, 2009.

As it can be seen, most of the funds have already been utilised as the average of all supports form is 92 per cent. However most of "keeping up the number of the bee colonies" has not been utilised at all. It predicts that most families do not want to deal with bee keeping in the long run, which will be one of the biggest problems of the sector.

Conclusions

The excellent Hungarian natural conditions provide the basis of high quality honey production. This high quality product has a stabile export market. Looking the trends of the international honey market the former Hungarian export markets are being influenced by South American and Asian producers. These products are cheaper, although the quality is lower. That is why the Hungarian bee keeping sector needs restructuring especially in the field of product development. These developments could be carried out by the utilisation of European Agricultural and Rural Development funds.

Based on the initiation of the EU Euroterroirs programme Hungary developed the so-called "Traditions, flavours, regions programme" (AMC, 2002). One of the main results of this programme was that all regions in Hungary could mark honey produced in the given region which would be very important for the potential consumers to identify the honey. This could serve also quality assurance issues.

Nowadays honey is not only a product but mostly to connect to healthy life style. From a research made by questionnaires in the North Great Plan region in Hungary turned out that emphasising that honey is a healthy product would increase the consumption (Arvane-Csapo, 2009).

Conditions of sales should be further improved. That means that a so-called "product" should be created from Hungarian honey. Unfortunately, currently Hungarian honey is exported in bulk. That is why the final packaging is done abroad so the foreign consumer does not meet it as

Hungarian honey. Another issue is that the excellent quality Hungarian honey is often used for improving poorer quality Asian and South American honeys. Besides the market problems honey production is connected to rural development issues as well. Since bee keeping is one of the solutions to earn money in rural areas support to the sector is essential.

The 15 thousand families (about 60 thousand people) give 1.5 per cent of the total number of people living in rural areas. As it was mentioned before, the total subsidisation for this sector is almost 4 million EUR, which gives about 40 per cent of these families' income. In this way this subsidisation has a so-called multiplicative effect, because without this subsidisation the government should "subsidize" these families. Based on our previous researches we think that the biggest problem in this sector is not the lack of the supporting system, but the cooperation between the actors. This could be eliminated through the creation of marketing strategy for the sector.

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KNOWLEDGE ECONOMY AND INNOVATIONS AS FACTORS OF AGRARIAN COMPETITIVENESS[1]

Branko Mihailovic, Vladana Hamovic, Vesna Parausic[2]

Abstract

Today, more than ever, development of agriculture leans on science research results and their practical application. Research in the field of agriculture is conducted by large network of public institutions, institutes and universities are mostly directed toward improvement of production. Economical research, at the level of husbandry, market analysis, or analysis and estimations of economic policy is poorly developed. Profitability of agriculture and food industry should be improved and supported by adequate research and application of gained results. Experience acquired in research and education systems of post-communist countries can help these countries change their economy towards knowledge, innovations and new technologies. But, in spite of great number of research workers and successful education system inherited from the communist period, it would be difficult for countries that were part of East Block to turn these potential advantages into commercially successful innovations unless universities and research institutions cooperate closely with private sector, what implies restructuring research system towards adjustment to agro-economy needs.

Key words: agro-economy, cooperation, performances, competitiveness.

Introduction

Significant factors regarding agricultural competitiveness improvement are entrepreneurship, science and innovations. Scientific explosion is essential characteristic of time we live in. Until today it remains unlisted, among other things, a new scientific paradigm. The new scientific paradigm was established at the end of 60-ies, simultaneously in several branches of science. Namely, in many sciences, conventional Decartes-Newton mechanistic presentation of the world was replaced by conception of self-organizing systems in period of transition. By studying thermodynamic processes, barrier of Nobel Prize, Prigogine discovered corresponding "phases of transition" and "self-organization". In its transfer from chaos to order, matter necessarily goes through transition phases, especially decision making phases, choosing from different alternatives. Thus, the new scientific paradigm was established, "the synergism-theory of interaction".[3]

Possibilities for new scientific paradigm implementation in economy are obvious. In contemporary business ambient, only the changes are constant. In unpredictable business surrounding only firms and economy systems that manage changes successfully subsist. Transition phases reflect in economy systems. Transitions in Serbia begun in 2000, when all the capital preconditions were met for its conduction. Liberalization of market relations

1 [1] The paper represents a part of research on project 149007 „Multifunctional Agriculture and Rural Development in Function of Republic of Serbia's Accession in EU", financed by MS RS.

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3 [3] Djuričin, D. (1996):"Transition of economy", *Ownership and freedom*, Social Sciences Institute, Belgrade, p.141.

and capital balance made possible for Serbian economy system to integrate into international finance and merchandise trends. Changes that had begun in economy domain, though under effect of numerous factors that amortized them, have gained characteristics of irreversibility. Namely, reform in economy system can hardly return back to it's starting point, and crucial is to discuss it's fluctuating tempo and instruments of macro-economical politics, which are often expected to establish balance between adversely situated economical goals.

Serbia improved its ratings progressing for 24 positions to 68th place of 175 countries estimated by business requirements, showed research conducted by World Bank and The International Finance Corporation in "Doing Business 2007" report. Serbia got ahead of all former countries of Yugoslavia, barring Slovenia. Although conducting numbered changes, Serbia lost leading position in reforms that it occupied in last year's report.

Current situation in farming sector in Serbia

Serbia has great potential in farming sector that is not entirely exploited. With appropriate farming politics, agriculture can contribute significantly to economical progress of the country. For its coherence and effect on other sectors, agriculture is of great significance for development in Serbia, as it employs directly or indirectly a large number of people partakes significantly in foreign trade, supplies with alimental security of population, and contributes to rural development and ecological balance. Agriculture in Serbia is facing many problems that are among others, results of restrictions occurred during economical climate and farming politics that was led after The Second World War until disintegration of Social Federative Republic of Yugoslavia and just as much, results of difficulties that arose during the last fifteen years and difficulties in market economy adaptation.[46] Agriculture in Serbia is concerned with consequences of centrally planned economy in partial ownership rights and land usage. For development, politics that stimulates productivity by restructuring and investing is needed, which implies clarification of ownership rights and obligations and establishment of efficient land market, crediting and inputs necessary for farming companies.

Up to present time, role of farming companies reflected in:

- Size economy of farming companies enabled appliance of contemporary techniques and realization and development of seed production;
- Concentration of expert staff enabled science and agriculture development and it's transfer to agricultural holdings;
- Farming companies were trigger buttons for establishment and development of food industry in same organizational frames of agro-industrial conglomerate;
- National and later on, social ownership, as a base for establishing state influence on farming companies, has granted them role of cheap goods manufacturers in function of self-sufficiency of elemental food products preservation, strategic stability of the country and social security of citizens;
- The concept of agricultural development, that enabled direct administrative control of farming flows gave those companies mediatory role between agricultural holdings on one side and input manufacturers of food industry on the other.

As all other companies, they have legal obligation of accounting book keeping, VAT (Value

4 [6]Agricultural strategy in Serbia, Ministry of Agriculture, Forestry and Water Management, Belgrade, 2004, p. 8.

Added Tax), property and income taxation, so from the formally-legal aspect they are in far worse position then the agricultural holdings. The stress falls on production structure that is less laboring intense and with relatively high degree of specialization in particular manufacturing units. Farming companies have relatively high presence of agricultural regulations application (compared to agricultural holdings), where the size of the holding is not one of the restrictive factors. Their organizational structure is very complicated and often overly outspreaded and conditioned by business function development level and it's numerousness, by it's formally-legal position, production specialization and similar.

Agricultural companies still dispose of certain storage space and farming product processing capacities, considering that their expansion thrived towards large business systems of conglomerate type that implied food industry development within company framework. Most of the food industry had separated itself organizationally from agricultural companies into individual business systems, though some storage and product processing capacities stayed within companies.

At large and complex agricultural systems apart from lack of investments, most important problem is inability to survive, as a result of pressure to break large systems into smaller ones.[5] Reproduction chains are separated, as well as primary farming production from processing industry, and the market is dominated by dealers and importer's lobby. All the healthy functions of the previously existing, solid system are lost, which was based on big agricultural systems in farming industry that gathered agricultural cooperatives and small owners.

Methods of knowledge economy affirmation and realization of long-term competitiveness of Serbian agricultural sector

Long-term export strategy aims at optimal utilization of disposable productive capacities, increase the size of agricultural production, change productive structure according to demand in favor of more intensive productions, final and high-quality products. There has to adjust to international market when it is about productive structure modifications and production adjustment concerned with quantity, quality and competitiveness. According to our productive capacities and comparative advantages, it is necessary to project the strategy of technological progress, agriculture and rural development, food industry and offensive export orientation. The competitiveness on well organized goods and services market has non-replaceable role of efficient technological development filter, and it is up to a state to direct and support an intensity of technological development in general interest.[6]

The methods for realization of long-term development strategy can be separated in four groups:[7]

- long macro-programs – developmental politics,
- agrarian politics measurements,
- institutional solutions or coordination and development direction,

5 Focus group: Place and role of large agricultural systems in strategy of farming, food industry and rural development in Belgrade area, Belgrade Chamber of Commerce, May 23rd 2008.

6 Mandal, Š. (2004): Technological development and politics, Faculty of Economy, Belgrade, p. 110.

7 Strategy of Serbian agriculture, Ministry of Agriculture, Forestry and Water Management, Belgrade, April 1997, p. 98.

- science and staff education, as well as organization of professionally-consultative department.

In *permanent macro-programs* pertain all programs on which should permanently and systematically worked on according to established plans and which are necessary for agricultural production development and providing the industries with raw material etc. Necessity for defining the permanent macro-programs became as a result of very clear defining of all necessary goals. It is important for changes to extend in 3 ways:

- structure change (producers, property and institutions) which encircles land reform, institutions in agriculture, privatization in agriculture and management of forest and water resources,
- development of market and its mechanisms which encircle: suitable measurements of economic politics in market economy, agricultural markets, price politics and other measurements of agrarian politics for market support, as well as credit market,
- rural development and environment preservation encircles: rural development and questions of agricultural environment.

The measurements of agrarian politics are the most significant for realization of long-term development strategy. Because of its natural characteristics of land, climate and water resources, Serbia has great potential in agricultural sector, which has not been totally used. Along with adequate agrarian politics, the agriculture can give significant contribution to economic development of the country. For its connectivity and influence on other sectors it is extremely important for development of Serbia, considering that employs, directly or indirectly, numerous people, participates significantly in foreign trade, provides food safety for the inhabitants and contributes to rural development and ecological balance. Agriculture in Serbia faces many problems, which are, among other factors, the result of limits ensued in conditions of economic environment and agrarian politics led in period after the World War II till SFRY collapsed, difficulties in adjusting to market economy.[8]

Institutional solutions of agrarian subsystem in market economy have main role in achievement of developmental goals. Their large role is determined by specificities of agricultural production. Large number of institutions in which jobs are being doubled does not contribute to long-term development. The main thing is that Ministry deals with all jobs related to agriculture as specific and the most important field of Serbian economy, including all that is underlined in developmental policy, than agrarian policy: prices, export, import, stockpiles, and to have full insight in work of financial institutions evolved in agriculture.[9]

For development of science, *staff education and organization of professional-advising department*, it is necessary to provide suitable legal basis, especially Law on professional-advising department, quality control and etc. Today, more than ever, development of agriculture leans on science research results and their practice application. Research is under authority of Ministry of Science and Environmental Protection. Researches in the field of agriculture are conducted by large network of public institutions, institutes and universities and are mostly directed toward improvement of production.

8 Strategy of Serbian agriculture, Ministry of Agriculture, Forestry and Water Management, Belgrade, 2004, p. 8.

9 Strategy of long-term agricultural, rural and food-industry development, Ministry of Agriculture, Forestry and Water Management, Belgrade, April 1997, p. 128.

Merging of farmers in function of knowledge transfer and innovations

Network economy is a new enterprise organizational-process model, which is developed owing to new constituent elements (information, innovations, communications, new technologies and such.). It significantly changes performances of international trade and competition in general. According to that, there are some models of networking in further text. These models contribute to widening of innovations and improvement of competitiveness of agro sector of Serbia.

Business Incubators. Business incubators are the instruments of local economic development for the support to newly-established small enterprises in the first years of their growth and development when they are most vulnerable.[10] Namely, in order to minimize ignorance and lack of experience in management, account-keeping, knowledge of the market and leading business in the beginning phase of the existence of the new small enterprises, these functions are put together through mutual service and occasional presence of consultants that have done these jobs for all enterprises in the large workshop – the incubator of the new enterprises.

Most often mentioned terms of incubator in our society are:[11]

- *Business and innovational centres***:** Concept business and innovational centre (BIC – Business Innovation Centre) is promoted by European Commision as an instrument of regional development. BICs are rules capacities the aim of which is generating new innovative enterprises that are involved in the activities of high additional value, but they are not compulsory technological.
- *Innovation centres:* Innovation centre offers advice and support in the development of new products and processes to small enterprises. That usually includes support in the development of prototypes for new enterprises, or help to the existing small enterprises to improve production processes. Unlike technological centres, they normally do not provide space for their clients.
- *Centers for enterprises – Incubators without walls:* Centers for enterprises give advice and help to undertakers and small enterprises, but, unlike ruled work spaces, they usually do not provide space.

Co-operatives. Forming co-operatives of agriculture producers on the principles of contemporary co-operative society creates the necessary conditions for achieving satisfactory production and economic results. Such concept is possible to apply to forming a whole production chain, beginning with primary production, over getting a number of half-products, to the highest degree of finalization. Agriculture producers co-operative, built on the principles of contemporary co-operative society, can be seen as a business system – an enterprise with all its business functions that could be realized through services, actually through the employed with appropriate specialties. Producers would be bringing objects of work in it, means for work and their work, and the co-operative, on the other side, would be providing all other services necessary for successful functioning of the production: commercial – the supply of production materials, product sales, marketing; financial – finding loans for fixed assets, finding loans for current assets; accounting – doing accounts for the economy; logistics –

10 Danilovic Grkovic,G.,Kovacevic B.,Sedmak A.,Nedeljkovic M. (2005): "Establishment of business incubators of technical faculties in Belgrade", *XIII Telecommunication forum TELEFOR 2005*, Belgrade, Sava Centre, 22.-24.11.2005.

11 Danilovic Grkovic, G., Kovacevic B., Sedmak. A., Nedeljkovic. M (2005): ``Establishment of business incubators of the technical faculties in Belgrade``, XIII Telecommunication forum TELEFOR 2005, Belgrade, Sava Centre, 22.-24.11.2005

putting things in stock, transport, distribution.

Clusters. Clusters can be defined as critical masses of enterprises and institutions in one place, of unusual competitive success in particular fields.[12] According to Porter, strong competetive advantages in global economy lie mainly in local things – knowledge, relations, motivation – differences that competitors cannot copy easily, and that can best be developed through clusters.[13] Cluster uniting means co-operation and being connected (by commonality and complementarity) of members, their geographic or local boundaries, active canals for business transactions and communications, creating a mutual product and/or services or mutual solving of some need or a goal.

The main factors in the development of clusters have to be enterprises participants. Only through their active participation cluster will grow stronger and develop. Educational institutions also have their role and in some cases they have proved to be a significant catalyst in the development of clusters. Universities can have educational role but they can also be key factors in research and development as well as in innovativeness in clusters themselves. Also, the constiuent part of the cluster form organisations for providing business services with expertise that suit to the needs of the cluster such as marketing, consultancy and similar organisations. All these bodies can contribute to strengthening the development of the cluster and can have a legitimate role in its development. Finally, local authorities, regional development agencies and other bodies have a significant share in speeding up the development of the cluster by means of interventions, strategic directing, donations, creating favourable development circumstances, organising educational seminars in regions, diminishing risk for starting business or risk when taking loans etc. In the majority of cases creating a cluster along the line ``from the bottom towards the top`` leads to so called semi cluster, more precisely societies, that have a chance of becoming clusters in future. The following ``clusters``, more precisely societies created owing to the initiative of members, not in order to get stimilus from the state, but in order for the enterprises within the cluster to take beter positions on the maret1 are worth paying attention to[14]: 'Society Fruitland', Cluster of agricultural producers in Kraljevo, ``Rakovica agriculture cluster``, Begeč society of vegetable producers.

Conclusion

Affirmation of knowledge economy and innovation impulses can be acquired by economy actors networking in agricultural sector in Serbia and by obtaining stimulating business environment, first of all, trough farming and macro-economical politics. Namely, with adequate agricultural politics, that can effect production increase, farming in Serbia can develop competitiveness and contribute significantly to economy progress of the country. Though a lot is done on the field of economy reforms, in up-coming period the country has the key role in favorable and stimulating macro-economical and business ambient creation, as the only basis for inducement of farming politics, directed towards restructuring, market

12 Porter, M. (1998): *Clusters and the New Economics of Competition*, Harvard Business Review, November-December, p. 78.

13 Porter, M. (1998): *Clusters and the New Economics of Competition*, Harvard Business Review, November-December, p. 78.

14 Mihailovic Branko, Parausic Vesna, Simonovic Zoran (2007): *The analysis of the factor of the business environment of Serbia in the final stage of the economic transition,* The Institute for the economy of agriculture, Belgrade, Monograph, pp. 120-122

development and agro-sector investment enhancement. Regulated country, well developed market, financial, institutional and infrastructural base, clear and edited law system and its efficient conduct – are the firs and elementary presumption to enable competition of entrepreneurs on the market. To maintain competitiveness of agriculture, macro-economical management has to change basic elements of farming development strategies, above all, for creation of sustainable farming systems, whose development is directed by knowledge and innovations, towards market development and agricultural product chain.

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THE CHOICE BETWEEN CONVENTIONAL AND ORGANIC FARMING – A HUNGARIAN EXAMPLE

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Abstract

The organic agriculture represents a promising alternative for the future of European agriculture. It is consistent with the notion of sustainable development set forth already in the 1992 CAP Reform. Despite of increasing importance of organic farming, the research on organic farming is still limited. This scarcity of the research is especially true for New Member States of the enlarged EU. This paper investigates the choice between conventional and organic production technologies for individual farmers in Hungarian agriculture. We apply a model that explicitly accounts for the effects of farm-specific variables like age and education on the expectations farmers have on the utility of both production technologies. In addition we take into account the perceptions of farmers about the organic farming. The model was estimated on a cross-section data set of Hungarian farmers for the period 2007 using a logit specification. It appears that education has a positive impact on the choice between conventional and organic farming, and, the size of the farm in hectares has a negative effect on this choice. Age and some general considerations on environmental friendly technologies do not have a significant effect on choice between conventional and organic farming.

Key words: innovation, attitudes, organic production, diffusion

1. Introduction

The organic agriculture represents a promising alternative for the future of European agriculture. It is consistent with the notion of sustainable development set forth already in the 1992 CAP Reform. Despite of increasing importance of organic farming in European agriculture, the research on organic farming is rather limited. The recent papers analyze the situation and motivations of organic farms only in some European countries: for example in UK (Burton et al. 1997, 1999; and Rigby et al (2001), in Spain (Albisu and Laajimi 1998) in Portugal (Costa et al 2005) and in Netherlands (Gardebroek 2002). This scarcity of the research is especially true for New Member States of the enlarged EU. Our contributions to related literature are twofold. First, this paper investigates the choice between conventional and organic production technologies for individual farmers in a New Member State, namely in Hungarian agriculture. Second, contrary to previous research which usually apply simple binary (logit or probit) model for investigation of farmers' motivations. We employ sequential logit model allowing us to get more insights for farmers' intentions.

The rest of the paper is organized as follows. Section 2 provides a brief literature review on the differences between organic and conventional farms as well as on the motivations to adopt organic farming techniques. The next section describes the survey design and the variables. The results are presented in section 4. The last section summarizes and offers some conclusions on the implications for the development of organic farms in Hungary.

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2. Literature review

The increasing interest in organic farming techniques has produced a number of scholarly articles that assess the differences between organic and conventional farms, as well as the decision to adopt. A number of these studies have collected farm-level data by surveying agricultural holdings and have qualitatively analyzed these data (Lampkin 1994; Freyer, Rantzau, and Vogtmann 1994; Fairweather and Campbell 1996; Fairweather 1999). There have also been a number of statistical approaches to address the issue of adoption of new technologies. These analyses can be classified into two main groups. A first group is composed of bivariate analyses measuring adoption at a certain point in time.

Burton et al (1999) analyse the determinants of the decision to adopt organic production techniques are examined applying binomial and multinomial logit techniques to a sample of 237 horticultural producers from the UK. The analysis indicates that organic horticultural producers are more likely to be young, run smaller enterpises and be female than their conventional counterparts, and that there are significant non-economic aspects to the decision to adopt organic techniques which may be missed in comparative profitability studies. In addition, results suggest that the registered and unregistered organic producers should not be regarded as a homogenous group, with significant differences in terms of the influence of gender and information sources observed.

Genius et al (2006) investigate organic land conversion in Crete using trivariate ordered probit model. Findings suggest that the decisions of information acquisition and organic land conversion are indeed correlated, and different farming information sources play a complementary role. Structural policies improving the farmer's allocative ability are found to play an important role in encouraging organic farming adoption.

The second group of studies comprises of duration analyses that explain how long it takes a farmer to adopt a particular technology. Burton, Rigby, and Young (2003) study the influence of a range of economic and non-economic determinants on the adoption of organic horticultural technology using discrete time models in UK. The empirical results highlight the importance of gender, attitudes to the environment and information networks, as well as systematic effects that influence the adoption decision over the lifetime of the producer and over the survey period.

Läpple and Donnellan (2009) investigate the adoption and abandonment decisions of organic farms in Ireland. They find that organic support payments emerge as important driving factor of adoption over time. The empirical results also highlight the importance of environmental and risk attitudes, farming experience as well as influence of other organic farmers on the probability to adopt organic farming; whereas decisions to abandon organic farming appear to be mainly driven by economic and structural factors. Farmers who have an off-farm job are more likely to abandon organic farming and a more 'intensive' farm system has a positive effect on staying organic.

Previous research has identified several relevant characteristics that influence adoption including both no economic and economic factors (Serra et al. 2007). Most important no economic factors are the farmers' personal characteristics (education, age), personal attitudes, lifestyle choices, concerns about health and the environment, access to technical and financial information on organic farming, geographical issues, and farm structural characteristics e.g. size of farms. Economic factors such as the availability of sales outlets, public subsidies, transition costs, or organic produce price premiums are also crucial to understand adoption processes.

3. Survey design and variables

In Hungary focusing on organic produce started in early eighties of the last century by founding a Club of Organic Producers in 1983. The successor of the Club, the Hungarian Federation of Organic Producers (Biokultura Egyesület) (HFOP) was founded in 1987. HFOP has 13 members of legal entity covering organic production across the country. Its profile covers wide range of activities from diffusing philosophy of organic farming through representing the interests of stakeholders up to supporting related research. Meanwhile HFOP has established Biokultura Hungary Ltd and the latter was authorized to register new applicants, controlling them at least once in every year and, releasing certificate if the producer met the requirements. 95 per cent of released certificates of organic farming come from Biokultura Hungary Ltd.

Looking at main tasks of HAOP the following can be mentioned: Communicating organic produce to the public; representing the philosophy of organic production to authorities; supporting organic programs; making the administrative requirements of organic production clear to producers; receiving new applicants; collecting, processing and spreading information on organic produce; protecting to establish new local units for a network of organic producers; helping to develop rural tourism.

Table 1 - Diffusion of organic production in Hungary (1995-2005)

Year	Number of organic farms	Total area covered by organic produce
1995.	108	8.232
1996.	127	11.937
1997.	161	15.772
1998.	330	21.565
1999.	327	32.609
2000.	471	47.221
2001.	764	79.178
2002.	995	103.672
2003.	1.255	113.816
2004.	1.420	128.690
2005.	1.353	122.615

Source: http://www.biokontroll.hu/biokontroll.php

Legal basis for organic productions is provided by Council directive of 2092/91/EGK and two more national directives as 140/1999 released by the government and one, 74/2004 of Ministry of Agriculture and Rural Development (MoARD). HFOP keeps record of all organic producers in this country and provides producers with information related to production, quality, market and, technology issues. Producers can put data and information on the website of NFOP after having the permission of Biokultura Hungaria Ltd.

Organic production has had an upswing in the late 80s and 90s of the last century and early this decade in Hungary, however, the dynamic was slowed down during last years (Table 1).

As accessing individual data of organic and conventional producers is very limited and such data cannot be found in published statistics, finally, two databases were used for sampling. First, a nationwide database of HAOP covering all counties and keeping records on organic producers on a voluntary basis. Second, concerning conventional producers we use the database of Agricultural Chamber of Pest county.

Concerning conventional farms the target was to have 99 farms in the sample with more or less equal distribution between sub-groups of ESU 1.00-1.99, ESU 2.00-5.99 and ESU 6.00-49.99. As no data on farm size by ESU was available in the database an iterative approach in sampling was required to be applied. In the Agricultural Chamber's database 677 conventional farms were recorded with ESU mostly above one. Farms with less than one ESU (not market oriented) were dropped. Only during the interviews it was turned out which size category the farm belongs to. In the first run 99 conventional farms out of those with ESU above were selected. However, to find the right number of farms for the sample in each category additional runs of sampling were needed. In the second, the third, and the fourth run further 35, 30, and 30 farms were selected. In number of cases it also turned out that the farms did not exist any more. In the four runs we have randomly selected total 194 farms. 127 out of 194 were interviewed. Among them there were 31 farms with 1.00-1.99 ESU and 31 with 2.00-5.99 ESU, and 35 farms with 6.00-49.99 ESU. In addition, interviews with further 30 farms with 50 ESU and above were done. Data on the latter farms were not dropped, but used in the analysis. Table 2 shows the definitions and descriptive statistics of the main variables.

Table 2 - Variable definitions

	Definitions	**Mean**	**Std. Dev.**	**Min**	**Max**
Adopter	1=if a farm is organic farm, otherwise zero	0.290	0.455	0	1
Education	1= primary school 2= lower secondary school 3=Upper secondary school (general) 4=Upper second. (pre-voc., techn.) 5=College or university degree	3.703	1.347	1	5
ESU	Number of European Size Unit	53.181	126.614	0.6	906
Total land	Size of the total land in hectares				
Rented	Size of the rented land in hectares	121.513	315.390	0	1970
Age	Age in years of the farmer	52.296	11.589	26	80
Fulltime	1=if a farm is full-time, otherwise zero	0.659	0.475	0	1
Diversified	1=if a farm produce more type of products, otherwise zero	0.569	0.496	0	1

4. Results

We analyze the farmers' intentions in two steps. First, we compare the characteristics of farmers using univariate statistics. Second, we analyze the potential determinants of the adoption decision using sequential logit analysis).

4.1. Univariate comparison

Comparison of Adopters with Non adopters

Table 3 - Comparison of Characteristics between Adopters and Non adopters of Organic Farming

	Mean		t Test
	Non adopters	**Adopters**	
Number of farms	127	52	
education	3.59	3.96	-1.7608*
ESU	61.18	33.64	1.6927*
Age	52.6	51.04	0.5713
Full time	0.62	0.75	-1.7187*
Rented land (hectares)	147.6	57.68	2.4658**
Diversified	0.47	0.80	-4.7300***
Total land (hectares)	181.04	103.81	1.6807*

Source: own estimations based on the survey

Legend: * p<0.1; ** p<0.05; *** p<0.01, Note: t Test calculated assuming unequal variance

Producers who adopted organic farming were more educated reported less farm size both in terms of the ESU and total land and less rented land (Table 3). Interestingly, the age was not different significantly between organic and traditional farmers. Approximately 75 per cent of the organic producers have worked as a full time farms compared to non adopters (62 per cent). Organic producers, on average, farmed fewer hectares (103.8) than non organic farms (181.4). On average, organic farms have been more diversified (80 per cent) compared to traditional producers.

Comparison of Adopters with Non adopters who consider being organic farmers

As observed in Table 4, there were still more differences than similarities between adopters and non adopters who consider to being organic producers. We have not found significant differences between two groups in terms of education, age and being full time farms. Non adopters used and rented more land and they have been less diversified compared to organic producers.

Table 4 - Comparison of Characteristics between Adopters and Non adopters who consider being Organic Farmers

	Mean		
	Non adopters with considerations	**Adopters**	**t Test**
Number of farms	81	52	
education	3.72	3.96	-1.0219
ESU	77.2	33.6	1.863*
Age	51.27	51.46	-0.0921
Full time	0.68	0.75	-0.8734
Rented land (hectares)	203.93	57.68	2.3904**
Diversified	0.47	0.80	-4.1028***
Hectares	239.44	103.81	2.0970**

Source: own estimations based on the survey

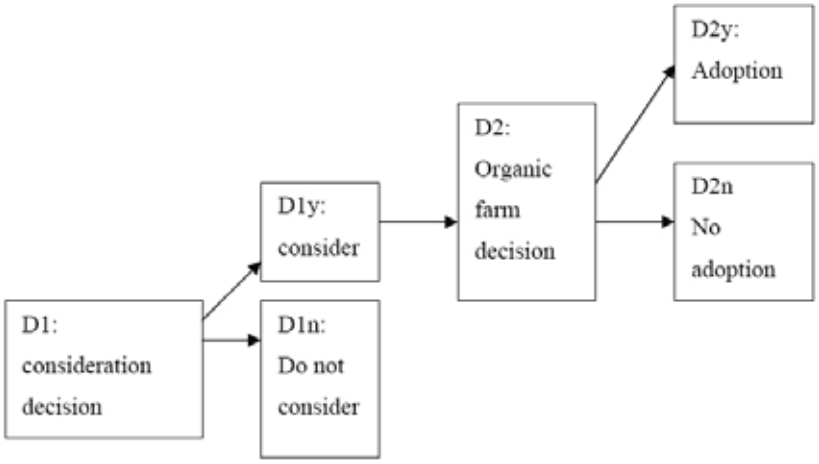
Legend: * p<0.1; ** p<0.05; *** p<0.01, Note: t Test calculated assuming unequal variance

4.2. Adoption of Organic Agriculture

If the adoption of the organic farming is conceptualized as a sequential decision problem it can be estimated as a sequential logit model based on separate logistic regressions for each step, decision or transition (see Khanna 2001, Buis 2009, Sauer and Zilberman 2009).

The decision to consider being organic farmers or not (*D1*) is followed by the decision to adopt organic technology or not (*D2*). If the farmer decides not to consider at all being organic farmers (*D1n*) then the adoption decision on organic technology (*D2*) is not relevant (see figure 1).

Figure 1



A rational farmer would consider on organic farming if the expected benefits U_{D1*} are greater than zero where

(1) U_{D1*}= U(D1y)−U(D1n)>0 and correspondingly would adopt the organic technology if the expected benefits) U_{D2*} are greater than zero with
(2) U_{D2*}= U(D2y)−U(D2n)>0

The net benefits U_{D1*} and U_{D2*} are latent variables, assumed to be random functions of vectors of observed exogenous variables *Z1* and *Z2*

(3) U_{D1*}= $Z_1\gamma_1+\varepsilon_1$ and U_{D2*}= $Z_2\gamma_2+\varepsilon_2$ where ε_1 and ε_2 are random error terms and γ_1 and γ_2 are vectors of unknown coefficients.

The observable choices of the farmer are

(4) U_{D1}= U_{D1y} if U_{D1*}>0; D_1= D_{1n} otherwise and

(5) U_{D2}= U_{D2y} if U_{D2*}>0; D_1= D_{1y}; D_2= D_{2n} otherwise.

However, the selection equation (5) is defined only over the subsample where D_1= D_{1y} (since D_1= D_{1n} and D_2= D_{2y} not observed). This three-way grouping leads to a bivariate sequential model with the probabilities of the three outcomes

(6) $P_{rD1y,D2y}$=Pr(D_1= D_{1y},D_2= D_{2y})=$\Phi_2(Z_1\gamma_1,Z_2\gamma_2,\rho)$

(7) $P_{rD1y,D2n}=Pr(D_1= D_{1y}, D_2= D_{2n})=\Phi(Z_1\gamma_1,\rho)-P_{rD1y,D2y}$

(8) $P_{rD1n,D2n}=Pr(D_1= D_{1n})=1-\Phi(Z_1\gamma_1)$

where Φ and Φ2 are the cumulative distribution functions of the standard normal distribution and the standard bivariate normal distribution with correlation coefficient ρ, respectively.

We apply a model that explicitly accounts for the effects of farm-specific variables like age and education, size of farms, share of rented land. We focus on the following hypotheses based on previous empirical literature (Padel and Lampkin, 1994; Burton et al., 1999).

Age - It is often stated that organic farmers are younger on average than conventional farmers. The hypothesis for this observed difference in age is that organic farms' practices are often implemented with a change of farm ownership (e.g. farmer's child taking over farm control from parents). An additional hypothesis is that older farmers are more conservative than younger farmers are and therefore more resistant to organic farming.

Education - Another often stated difference between organic and conventional farmers is the education level. Explanations are given those organic farmers that are new entrants to organic farming are usually high-educated and idealistic. However, it could also be that higher educated farmers expect to cope with difficulties in organic farming better than conventional farmers.

Size of farm - The relation between organic farming and farm size differs by country. However, the hypothesis is that there exists a positive relation between organic farming and number of hectares. Organic farms are more extensive than conventional farms requiring more land for pasture. Moreover, organic farms use more roughage than concentrated feed and this roughage may be produced on the farm, requiring more land.

Rent - If the major part of the farm is rented, deciding to farm organically may raise objections from the landlord. This conflict may also have an impact on the decision process.

Table 5 - Sequential Logit Results for Adoption of Organic Agriculture

	Logit 1	**Logit 2**
education	0.184	**0.354****
esu	-0.001	-0.002
rented	0.002	-0.002
age	**-0.027***	0.007
full	**0.764****	**0.710***
diversif	**0.602***	**1.518*****
constant	0.166	-4.085***
N	179	133
Log pseudolikelihood	-169.089	-75.421
McFadden's R^2:	0.082	0.153
McKelvey & Zavoina's R^2:	0.158	0.315
Count R^2:	0.754	0.654
Correctly classified	75.42%	65.41%

Source: Own estimations based on the survey; legend: * p<0.1; ** p<0.05; *** p<0.01

In addition, we consider two additional control variables, namely being full time farmers and family farms, and diversification of production.

We consider various specification estimating two farm size proxies separately. In addition, we check

whether does nonlinear relationship exist between the size of farm and the adoption of organic farm, thus we apply squared size variables. In addition, we introduced the squared age variable due to same reasons. However, preliminary analyses show that we can reject the non linear relationships between the size of farms/the age of farmers and adoption of organic technology. Our estimations reveal that being full time farmers, and having more diversified production structure have positive impact on the adoption organic farmers at the both stages of decisions. The age of farmers has negative influence on the consideration for being farmers, whilst the higher education has positive impact on the adoption decision.

5. Conclusion

Although organic production represents a promising alternative for the future of European agriculture, but organic farming is in still infancy in Hungary, its dynamics was slowed down during last years. The study investigates the adoption of organic technology in Hungarian agriculture using a survey among organic and conventional farmers. We focus both on farmers demographic and farms characteristics to explain the adoption behaviour. The results highlight that there are significant differences between adopters and non adopters farms regarding to the size of farms, the education of farmers, being full-time farmers and the diversification of production. We apply sequential logit model to explain farms decisions of adopting organic technology. Estimations show that being full time farmers, and having more diversified production structure have positive impact on the adoption organic farmers' decisions. The age of farmers has negative influence on the consideration for being farmers, whilst the higher education has positive impact on the adoption decision. This paper is only the first step to analyse the behaviour of Hungarian farmers on adoption of organic farming. Further research is needed to better understand why organic production is developing slowly in Hungary.

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FOREIGN DIRECT INVESTMENTS IN SERBIA – STATE AND PERSPECTIVES

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Abstract

The last decade of the twentieth century was very successful for a number of ex socialist countries of Central Europe. That was the decade of prosperity, progress, and getting closer to the modern and developed European countries. This region (Slovenia, Poland, Czech Republic, Hungary, and Slovakia) comprises group of countries in transition, which are in the front line in the process oh transformation of their economic systems, implementation of economic reforms and attracting private foreign investments, first of all, foreign direct investment. In contrast to these countries, in the area of former Yugoslavia, the early 1990s were the years of complete disintegration, marked by economic sanctions, huge human causalities, and vast destructions. The dramatic political situation Serbia was in, caused heavy consequences on its social-economic development. The result is that Serbia today is one of the least developed countries in Europe. Position of Serbian economy drastically aggravated in the area of international capital flow.

In this paper we analyze one form of international capital flow that can start up the Serbian economy – foreign direct investment. In the period to come, the development of our country will mostly depend on the value of foreign investments. Without direct foreign investments and conditions of low domestic savings, limited opportunities for crediting, lack of management knowledge, modern technology and export routes, there is not going to be any economic development in Serbia. In that sense, the most prominent is the need to affirm our competitory advantages and to remove the existing limitations for foreign investments so that conditions for foreign investors to realize in the fastest way their ideas for investments are created.

Key words: Capital flow, foreign direct investment, Serbian economy.

Introduction

Long isolation of the Serbian economy from the world economic and trade activities left very negative consequences on its economic performance. Dramatic political situation in Serbia has left heavy economic consequences on its social-economic development, and its position in the international capital flow was drastically worsened.

After reintegration of Serbia into international economic system causes significant improvement of economic relationships, which leads to strengthening foreign direct investment activities, but this strengthening is still below real needs of Serbia.

This paper analyses one of the forms of international capital flow that can instigate progress of Serbian economy in the current global economic crisis – FDI-s. FDI-s development effects are numerous, such as: export growth, modern technologies transfer, GDP and investments growth and improvement of domestic management skills. All of the above confirm that FDI-s is the necessary precondition of the economic transition of the Serbian economy and its integration in the global economy.

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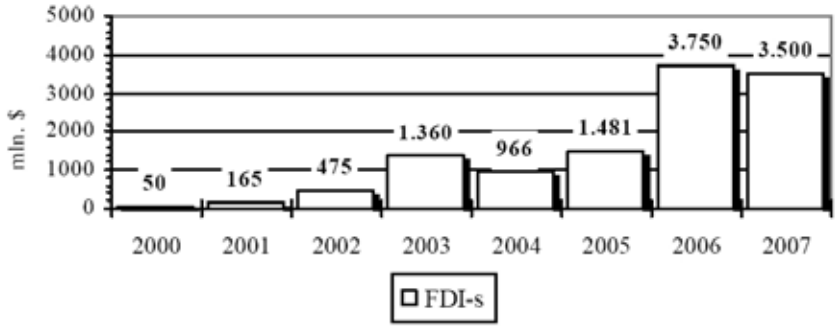
Current results in attracting FDI-s

More significant number and amount of FDI-s in Serbia have been attracted after its reinclusion into contemporary world integration processes. Within that context, in the beginning of 2000s, relationships with the most important financial institutions were regulated, manifold bilateral agreements on investment protection were signed as well. On the other hand new legal regulation that is affirmative for the FDI-s, such as Privatization Law, Law on FDI-s, Law on Concessions, etc were approved. These activities contributed to the improvement of the investment climate in Serbia.

More significant amount of foreign capital was invested in Serbia only after 2000. If Italian and Greek investment into "Telecom Serbia" (USD 740 million in 1997 and USD 113 million in 1998), are left out, net FDI inflow did not get over USD 100 million until 2000. The amount of FDI-s grew from USD 165 million in 2001 to USD 3,500 million in 2007. (USD 165 million in 2001, USD 475 million in 2002, USD 1,360 million in 2003, USD 966 million in 2004, USD 1,481 million in 2005, USD 3,750 million in 2006 and USD 3,500 million in 2007). The inflow of FDI-s in 2000-2007 periods was USD 11.7 billion or USD 1.47 billion annually. The figure below presents the net values of FDI in Serbia during 2000-2007.

Figure 1 - FDI-s in Serbia 2000-2007



Total amount of FDI-s in 2001 was 2.5 times higher than in 2000. More interest from foreign investors in 2001 can be expressed through significant increase of the contracts. According to Federal Ministry for Relations with the Abroad, 1310 contracts with the foreign investments were registered in 2001, which was several times more than in the previous years. Out of the number above, 639 companies were registered as 100% foreign owned, and 638 companies were founded as mixed capital, i.e. joint investment of foreign and domestic companies.

Regarding the sector structure, i.e. activity into which the capital was invested in 2001, different activities were of interest for foreign capital, with the leading position of trade and services (over half of registered contracts were in these sectors).

During 2001 significant amount of FDI-s were in the banking sector when the following banks were founded in Serbia: "Micro-Finance Bank", "Raiffeisen Bank Yugoslavia", "HVB Bank Yugoslavia", "National Bank of Greece" and "Societe Generale Yugoslav Bank".

According to regional distribution of FDI-s, most of companies were founded in Belgrade, Novi Sad, Subotica, Nis, Cacak, Valjevo, Kraljevo, Krusevac, Pancevo, Sombor, Vranje, Uzice and Leskovac.

In 2002 the inflow of FDI-s in the Serbian economy was 475 million. Unlike previous years, during this period most of FDI-s come in the form of cash as a consequence of significant privatizations. In that sense, very important privatizations were "Beochin Cement Factory" to the French "Financiere Lafarge S.A" (USD 50.89 mln), cement factory "Novi Popovac" to the Swiss "Holcim" (USD 52.5 mln) and cement factory "Kosjerich" to the Greek company "Titan" for USD 35.5 mn. Krusevac based factory "Merima" was sold to the foreign partner for USD 42.3 million, while at auctions companies worth USD 16 million were sold to foreign legal persons.

Inflow of FDI-s in 2003 was more than USD 3,300 mln, due to tobacco companies sale, while during 2004 there were less FDI-s as a consequence of slowdown in the privatization process. During 2005 FDI levels was higher again. In 2006 Telecom ''Mobi 63'' was sold for EUR 1.5 billion and farmaceutical company ''Hemofarm" for EUR 485 mln, which together with other investment brought the FDI level at USD 3.5 billion. Similar inflow was achieved in 2007 as well.

The highest inflow of FDI-s during 2000 - 2007 (Table 1) was for the purchase of companies and property through the process of tender and auction privatization (more than 50%). The process of privatization was the most important channel of FDI-s inflow in the Serbian economy, which leads to high corelation level between FDI-s and privatization, where one stimulates the other and vice versa. Apart from sale of domestic companies, one has to emphasize that there were g*reenfield* investments, which are more often present in the lower risk surroundings and higher transparency countries and whose effect on the increase of the total investment is larger than the ones from mergers and acquisitions. That means that the effect of the total level of investments in the country depends upon the type of FDI-s.

Table 1 - The largest FDI-s in the Republic of Serbia

Company	Country of Origin	Sector	Investment Type	Amount (EUR min)
Telenor	Norway	Telecommunications	Privatization	1,513
Mobilkom	Austria	Telecommunications	Greenfield	570
Philip Morris – DIN	USA	Tobacco industry	Privatization	518
Stada	Germany	Industry	Capital market	475
Banca Intesa – Delta banka	Italy	Banking	Capital market	462
Interbrew – Apatinska pivara	Belgium	Beer industry	Capital market	430
NBG	Greece	Banking	Privatization	425

Company	Country of Origin	Sector	Investment Type	Amount (EUR min)
Mercator	Slovenia	Retail	Greenfield	240
Lokoil – Beopetrol	Russia	Oil industry	Privatization	210
Holcim – Novi Popovac	Switzerland	Cement industry	Privatization	185
OTP Bank	Hungary	Banking	Privatization	166
Alpha Bank – Jubanka	Greece	Banking	Privatization	152
U. S. Steel – Sartid	USA	Steel	Brownfield	150
Metro Cash & Carry	Germany	Wholesale	Greenfield	150
OMV	Austria	Gas stations	Greenfield	150
Coca Cola	USA	Beverages	Capital market	142
Africa Israel Corp. Tidhar	Israel	Real estate	Capital market	120
Droga Kolinska Grand prom	Slovenia	Industry	Greenfield	100

Source: SIEPA (Serbian FDI Attraction State Agency)

Regarding the amount of investments in Serbia, as of origin of capital, over 76% of FDI-s has come from Norway (24,6%), USA (13,1%), Austria (11,7%), Geramany (10,1%), Greece (9,4%) and Italy (7,5%). From the sector point of view most FDI-s came to telecommunications, banking, cement, oil, tobacco industries, etc.

On the basis of the current experience of attracting FDI-s, one can notice that the FDI inflow increased very much after 2000. But, although there were more FDI-s in the recent years, their amount is still not sufficient.

The FDI stock in the Serbian GDP is still below EU average. In 2006 the FDI were 32%, while in the EU then 25 countries was 38%.[4] Although Serbian GDP in 2007 was 45.8% higher than in

4 Development of Serbia Report *2007*, Development Fund of Serbia, Belgrade, 2008, page129.

2000 (average annual growth of 5.6%) and FDI level was 70 times higher (average annual growth of 83.5%), FDI inflow per capita is still low – 50% lower than in Croatia and more times lower than in Romania, Poland, Hungary and Czech Republic.

The following data show the level of our lagging behind successful transition countries in the area of attracting foreign capital.[5] For example, Slovakia was the most successful transition country regarding FDI attraction in 2006. It got USD 13 billion, out of which USD 10.9 billion was in corporate and USD 2 billion in the banking sector. The Czech Republic was on the second position. It attracted USD 11.4 billion, out of which USD 5 billion in transport and communications, USD 1.9 billion in real estate, and USD 1.4 billion in production. Poland had USD 7.7 billion of FDI-s, which was significant fall compared to 2004, when it had USD 12.8 billion. In 2005 Hungary had USD 6.8 billion of FDI-s, while it's total FDI level between 1994 and today was USD 63.3 billion. Now there are more than 25,000 companies with foreign ownership in Hungary. Romania had USD 6.6 billion of FDI-s in 2005, which was achieved despite the fact that there were no major privatizations that year. In 2006 economy of Romania had USD 6 billion of FDI-s.

Probably the most representative example for Serbia is the case of Bulgaria, which in 2002 had USD 969 million, while in 2003 more than USD 2 billion. Since than FDI-s level was never below USD 2 billion. In 2005 only, Bulgaria had USD 2.3 billion of green field FDI-s.

It is obvious that FDI inflow into Serbian economy was lower compared to other transition countries and that, despite the positive trend since 2000, it is still not sufficient from the point of view of development needs of Serbia.

This conclusion is confirmed by the fact that the structure of FDI-s is not good. Namely, Greenfield investments still do not comprise dominant form of FDI-s in the Serbian economy. Most of FDI-s still comes in the form of domestic companies' privatization. However, that type of inflow is limited by the end of privatization process. Having that in mind as well as the low level of Greenfield investments, it is necessary to take permanent activities for creation of the better investment climate for FDI attraction and stimulation of Greenfield investments.

Examples from the neighbouring countries show that the Greenfield was the significant instigator of the economic development and dynamic of export activities, which is the reason why this type of FDI-s has to become the basis of the Serbian strategy for foreign capital attraction. The future more dynamic inflow of foreign capital must not be based on the sale of parts of the infrastructure system, which is most attractive for the foreign investors, but first of all on the stimulation of FDI-s that can lead to restructuring of the economy which should become more competitive on the global market.

Although the process of reintegration of Serbia into international community contributed to certain increase of foreign investment activities, these are still not sufficient for the start up of economic development process. In order to catch the large lag of Serbian economy time and high GDP growth rates are necessary. In order to achieve both of these more FDI-s are needed.

Comparative advantages of Serbia in the area of FDI-s attraction

Having in mind the conclusion that FDI-s are the most important means of economic recovery of Serbian economy, the strategy of foreign capital inflow has to become the basis of its economic

5 Data from daily Danas.

and development policy, particularly in the conditions of the current economic crisis. With that aim, it is very important to define priority sectors for foreign capital, as well as establish the best forms of that inflow. National strategy of foreign capital inflow has to define type of necessary foreign investments, as well as sectors that have to be developed.

Comparative advantages of Serbia define the selection of economic sectors that have to be developed within which foreign investments can be best realized. The basic direction of the strategy for attraction of foreign capital has to be focused towards those sectors that can use Serbian advantages, out of which the following ones are the most important:[63]

- geographic and strategic position - that has to be used better,
- cheap and educated workforce,
- size and connectivity of domestic market with other markets,
- natural resources and others.

Infrastructure investments are particularly important for Serbian economy having in mind that these can create conditions for investments in other sectors, which would remove underdevelopment of infrastructure as significant limitation for foreign investors. In this context, attraction of foreign capital should be promoted through concessions. Serbian economy can offer concession in the following sectors: highways, railways, mines, spa and mountain tourism, etc.

Metal and chemical complexes of the Serbian economy are its investment opportunity, with the notion that sub-sectors that can be competitive have to be defined on the regional markets. Metal processing industry, some time ago very important exporter has big problems nowadays, and structural changes within it as a result of FDI-s inflow could significantly contribute to the renewal of export.

Telecommunications, where local market determines interests and business decisions of foreign investors has already attracted large foreign investments but it is still investment opportunity of the Serbian economy.

Agriculture and tourism are also important sectors of interest of foreign investors. Having in mind big problems in the financing of agriculture, which is still underdeveloped and does not have its own capital, foreign investments in it are the best solutions for Serbian economy. Foreign partners are particularly interested for financing products that can be produced at the high quality level in their countries: special high quality products with the certificate on health. Tourism as economic sector goes through its peak and is special challenge for countries that find tourist services one of the opportunities for economic development. Serbia belongs to a group of transition countries that confront manifold economic difficulties for which tourism development is an opportunity to overcome. Natural resources of Serbia and good geographic position can be an advantage for attracting foreign investors in the tourism sector. Intensifying foreign investment activities in the tourism assumes the following advantages: construction of new, modern tourist capacities, and modernization of the existing ones, application of contemporary information technology and inclusion into global distribution systems, innovation of promotional activities, affirmation of the modern concepts of marketing and management in tourism and raising the level of quality of complex tourist services according to the demands and criteria of the global market.

6 [3] D. Đurić, Ekonomska tranzicija u Srbiji 2001-2005. – Rezultati, strategije, perspektive, Ekonomski anali, Tematski broj, Belgrade, April 2006., page. 284.

Qualification and low cost of the workforce are the advantages that can be used for attracting foreign investments into textile and clothing industry. These are the workforce intensive sectors where competition advantages of the Serbian economy related to workforce are expressed. National strategy of foreign capital has to favour competitive sectors whose advantages are not founded only on the qualified workforce and many natural resources, but also tradition in production of certain goods and services. That is why clothing, shoes, furniture, jewellery, drinks, etc are attractive for foreign investments.[74]

Traditional European partners are the most important groups of foreign investors that can be expected in Serbia. Apart from attracting large global organizations that bring huge capital, the interest of the Serbian economy has to take care of small and medium enterprises that are readier for entrepreneurial risk and which take less care of economic and political limitations

Ex socialist countries neighbouring to Serbia are potential investors, because of geographic closeness and their transition experiences. Particularly important are the ex-Yugoslav countries. Calming down of political tensions and manifold connections of economic entities that use to function within a joint economic area provides opportunities for more active investment engagement.

Mobilization of capital and economic potential of Serbian citizens that live and work abroad can also be important source of financing development needs of Serbia. With this aim, the experience of Greece that due to its diasporas (Greek companies and individuals) quintupled its export to Balkan countries during the nineties is useful. In order to achieve good results it is necessary to leave the assumption of patriotic reasons for investment in Serbia of its citizens that work abroad. For achieving success in this area it is important to provide stable institutional ambience that with more efficient work of diplomatic representatives abroad can animate Serbian diasporas to more intensively invest in Serbia.

With the aim of attracting FDI-s it is necessary to have much more aggressive strategy of promotion of Serbia as attractive location for foreign investments. Having in mind that the role of the state in attracting FDI-s nowadays is changed, it has permanently to make efforts to promote potential possibilities for investment in the country and raising the level of services to possible foreign investors.

Limitations for foreign investments and how to eliminate them

Greater attracting of foreign investments into our country, as we have emphasized, must become crucial for the country's future economic and developmental policy. The task will not be an easy one, especially when having in mind the fact that, according to the estimations of the United Nations Conference on Trade and Development (UNCTAD), foreign direct investments in the world in 2008 decreased more than 20% because of the financial and economic crisis. This only shows that the efforts of the countries which want to attract foreign capital in present conditions need to be enhanced more. In this sense, we point out, in this part of the paper, some limitations for foreign investments in our country and the need to eliminate these so that a better environment for investors from abroad is created in Serbia.

Difficult conditions of international competition which are dominant inn the world market capital demand more modern and efficient countries with stable institutions. The process of creating a stable political and legal framework provides safety for foreign investors. They value the most

7 [4] D. Đurić, Investicioni gep, Ekonomska politika, no 2815, Belgrade, 2006., page. 17.

the stability of a country, not just its profits, market potential, geographical conditions, cheap and specialized work force, knowledge and infrastructure.

Having in mind the previously mentioned characteristics of the legal and political system, it is clear that foreign investments depend directly on the risk of the country in which it is being invested. The most important economic and financial indicators of a country present significant elements of estimating the risks of a country for foreign investments. However, besides these, both the political and social conditions of a country greatly determine the attitude of foreign investors towards the climate for investments and the possibilities for investments. In that sense, the negative image of Serbia in the world, as a consequence of dramatical, political occurrences and the war in the previous period, greatly limited foreign investments in our country.

The lack of an efficient legal system and political security have for many years been the most important restrictive factors of attracting foreign investments to our country. However, bureaucracy is currently a very big problem, when compared to the previous period, when the greatest obstruction for foreign investments was the political risk. For instance, we have the most stimulative tax system but we do not use this advantage enough because of large tax administration.

It is the stable political and economic environment, certainty in business and simple procedures for starting production that is important to foreign investors. The amount of future foreign investments in Serbia depends greatly on the readiness to eliminate the administrative barrier, to simplify the procedures and to increase administrative efficiency. In this sense, it is very important to accelerate the procedure for acquiring building permits. Up to now this has been a very long process and because of it Serbia has been, according to the World bank analysis, on the very bottom of the world ranking. The World Bank experts have calculated that 271 days (9 months) are needed to realize ideas for investments in Serbia. In all other countries which are our competitors, that period is greatly shorter.

There is a great difference in the readiness and the quality of acquiring investment permits among our municipalities and cities. Municipalities, where procedures for obtaining the necessary permits for investments are easier and more efficient, attract a larger number of foreign investors.

The new Law on arranging the environment and construction, which should significantly simplify the procedure for obtaining permits, as well as a number of space and urban plans which a municipality has to make, to create new penalties for local self-governements which do not give permits and plans in due time, can significantly influence the improvement of competitiveness of our country for foreign investments. Realization of foreign investments also depends on efficiency of business activities of public enterprises, which are also included in the process of issuing certain permits for electircal connection, gas connection, telephone connections, water etc. One of the problems that foreign investors encounter is also the corruption in issuing the needed permits.

Efficient municipalities, the representatives of which think in a manner related to the market, have also recognized the problem that foreign investors encounter in the form of expensive land and organisation of construction sites. Some municipalities, such as Jagodina and Batocina, often give free land or they offer land for a low price if investors satisfy certain conditions.

One of the limitations for foreign investments is also an inadequate educational system which is very often not well-adapted to the new investments. In that sense, it is necessary to introduce

new educational programs which will be adjusted to modern market demands.

Insufficient interest for foreign investment in Serbia is also a consequence of absence of adequate information about the possibilities for investments in our country. A great number of investors does not know that we have a special Agreement for free trade with the Russian Federation, Turkey, Belorussia and a preferential status in trade with the European Union and the USA. In order to attract SDI, it is necessary to have a more aggressive strategy in promoting Serbia as an attractive location for foreign investments. Bearing in mind the fact that the role of the country in attracting SDI under current conditions completely changes, it has to make efforts in promoting potential investment opportunities of the country and to improve the service for potential foreign investors.

Conclusion

Foreign capital is with no doubt very important means of economic recovery of Serbian economy. The only form of international flow of capital which can put in motion the production of Serbian economy and increase its employment are direct foreign investments. Managing organs in our country must make continuous efforts to create the necessary conditions for the creation of favourable investment conditions for foreign investments. The low level of domestic savings and a high indebtedness of our economy present the developmental limitations which can be overcome only by active attraction of private foreign capital.

With the aim of securing its attracting in the near future it is necessary to as quickly as possible remove existing barriers and limitations and take measures towards creating good business conditions, faster implementation of the economic reforms, and further inclusion of the country into international financial and political organizations. If the above is not done foreign investors would keep treating Serbia as unattractive and high risk area for investment, which would have negative consequences for the economy of Serbia.

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THE ROLE OF SMALL FARMS IN REPUBLIKA SRPSKA: BARRIERS AND OPPORTUNITIES FOR MODERNIZATION[1]

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Abstract

The paper aims to explore and analyze the main barriers and opportunities for the modernization of the agricultural sector of Republika Srpska with a specific focus on the role of small farms. A particular attention has been given to specific elements related to the human, social, and institutional capital.

Methodologically the work has been based on an extensive desk research, on the use of a field survey and on a number of personal interviews with national experts and professionals. Overall the investigation has also greatly benefited from the theoretical framework elaborated by R. Yin within his "*case study methodology*".

Key words: small farms; subsistence farming; Republika Srpska.

1. Introduction

In describing the evolution of the Balkans Micheal Pailaret used the expression "*evolution without development*" and concluded that policy makers had spoiled rather than valued the natural and human resources of the region.

Within this framework agricultural and rural areas have been often neglected to the periphery not only physically, but also economically and politically. This is particularly evident in Bosnia and Herzegovina due to the extremely complex administrative organization created with the Dayton Peace Agreement in 1995. This complexity has lead to an extremely controversial policy environment that has been strongly characterized by the lack of a long-term perspective and by a non harmonized regulatory framework in which single municipalities have promoted individual development strategies.

The development of clear policy objectives and endorsement of a long-term, coherent and mutual agricultural and rural development policy have also been affected by structural problems: a lack of reliable information on population and other relevant issues, the absence of an adequate land registry system and cadastre. Moreover Bosnia and Herzegovina (BiH) agricultural sector is characterized by many factors that have typically affected transition countries such as land fragmentation, lack of agricultural mechanization and outdated production technologies, and rural aging, high unemployment and out-migration.

Small farms still dominate rural areas so their viability and their inclusion in long term agricultural and rural development strategies still represent a major issue in the academic and political debate.

The paper aims to explore and analyze the main barriers and opportunities for the modernization

1 M. Vittuari has been responsible for paragraphs 1, 2, 3, 4 and 5. A. Segrè has coordinated the work.

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of the agricultural sector of Republika Srpska (RS) with a specific focus on the role of small farms. A particular attention has been given to specific elements related to the human, social, and institutional capital.

2. Theoretical framework

In South Eastern Europe the agricultural sector is still characterized by a dualistic structure composed of market-oriented commercial farms and small-scale subsistence farms. So an important part of the production is used predominantly for self-consumption and not for selling. This large share of subsistence makes agricultural performances often unpredictable (P. Kostov, J. Lingard, 2002).

Although no standard definition of subsistence farming exists, this phenomena is generally associated with small holding size, family agricultural work as a part-time or supporting activity, lack of machinery, difficulties in purchasing inputs and marketing products (assuming that they generate a marketable surplus), and lack of added value to primary commodities (Z. Lerman, 2004).

So, generally speaking, the term subsistence agriculture is used to identify those farms that are consuming a fundamental part of their own net production within the household, and, therefore, do not primarily produce to sell on the market. The larger is the share of self-consumption, the higher is the degree of subsistence. According W. Doppler (1994) a classification of subsistence farms could result as the following: farms producing at least 90% for their own consumption are subsistence oriented, farms producing between 10% and 90% for their own consumption are semi-subsistence farms, farms consuming less than 10% are market oriented.

Although a common definition is lacking, in agricultural economics literature, the term "subsistence agriculture" has a predominantly negative connotation (R.E. Seavoy 2003, M. Brüntrup, F. Heidhues, 2002). Subsistence-oriented agriculture is said to lack efficiency of resource use for various reasons:

- the priority given to satisfy family needs;
- the lack of market orientation;
- the lack of use of formal credit;
- external inputs are rarely used in subsistence production;
- technological backwardness;
- low responsiveness to policies.

Subsistence farming defined in these terms reflects, therefore, both historical factors and equally rational responses to high levels of rural unemployment, low incomes and social security systems. Such social security transfers play an important part in agricultural household income and could easily account for more than half of total agricultural household income in some countries. Subsistence farming can, therefore, play an important role in overall family welfare and, equally, in absorbing labor where alternative sources of employment are scarce.

3. Methodology

Methodologically the work has been based on an extensive desk research, on the use of a field survey and on a number of personal interviews with national experts and professionals. Overall the investigation has also greatly benefited from the theoretical framework elaborated by R. Yin within his "case study methodology".

The desk research has been focused on the collection and examination of country surveys, reports and research papers, official reports of national agencies, national and international databases.

The field survey[4], based on a structured questionnaire[5], has involved 215 agricultural households in 5 "*regions*" of RS (Banja Luka, Bijeljina, Doboj, Sokolac, Trebinje). Since the administrative division of RS does not foresee the regional level - only the municipal level - the 5 regions were selected by following the territorial network and organization of the Agency for Extension Service of Republika Srpska.

Farmers have been selected randomly among those asking for advice or assistance to extension services (this criterion has been used to partially overcome the absence of a land registry). Moreover the number of respondent per region has been partially balanced according: the total population and the total sown area of each region.

The selection of the sample has been particularly complex due to the lack of data resulting from: an unclear definition of who can be identified as farmer in RS[6]; uncertain information regarding the total number of farmers in the Entity; the lack of a land register (a project to complete land registration has been initiated at the beginning of 2008 thanks to a World Bank loan); the number of farmers working part time or full time in other sectors and so not classified as agricultural workers by official statistics (World Bank, 2004).

Personal interviews have been carried out with a number of national and international experts in order to overcome the lack of data on specific issues and to collect expert opinions for certain dynamics.

4. Results

4.1 Farm size

The sample in the survey respects the farm size estimations of the major reports and studies: a significant number of farms have a size lower than 5 ha. Farms above 10 hectares included in the sample are generally located in mountain areas or present a significant share of unutilized land.

Table 1 - Farm size

Farm size	Number of farms (%)	Number of farms - Cumulate %
0-1 ha	8,4	8,4
1-5 ha	37,4	45,8
5-10 ha	36,5	82,3
10-30 ha	17,7	100,0

Source: elaboration of the author

4 The survey does not aim to be exhaustive and the limits of this approach are evident especially in the size and in the selection of the sample. However, even if the survey does not aim to have a statistical significance, the results are extremely significant in order to explore the main characteristics of the subsistence sector and to provide additional and updated field information.

5 The questionnaire has been prepared by and the survey coordinated by Renata Rakic (Agency for Extension Service of Republika Srpska), Gordana Rokvic (Department of Agricultural Economics, University of Banjaluka), Matteo Vittuari (Department of Agricultural Economics and Engineering, University of Bologna).

6 The Law 01-892/06 defines as farmer who is holding a registered farm or a member of a family farm who is engaged in agricultural production. A family farm is a farm owned and operated by a family. The definition remains unclear due to different classification that can be used to identify family farms.

Besides farm size a major constraint is land ownership which is still under a transition process. A large share of agricultural households do not have formal documents to certify their property or the rental status of the land (renting without contract is a quite common practice). Moreover, among the 50% of registered properties there is a variety of situations. An exception is represented by the few large producers who are in possession of the legal documents for the land they have rented.
Labor is largely the main input and in general the overall level of mechanization remains poor also due to the average farm size which is largely inappropriate for a modern mechanization and to the lack of financial resources that would allow to purchase or to rent machinery. Moreover the existing technical equipment is generally outdated.

4.2 Market vs subsistence

Grain, fruit and vegetables are produced mainly for self consumption while the marketed share is considerably low. The case of fruit production, where only the 5% produce manly for the market and an additional 5% sell on the market at list the 70% of the total production, is particularly significant.

Farms based on fresh meat and fresh milk productions are generally more market oriented. Among the reasons behind the development of this sector there are: a well developed milk processing industry, a well structured shredded milk collection network, the opportunity for a valuable monthly income for small farmers, low market costs and fixed investments.

Table 2 - Market orientation by product (%)

Product	Mainly for family consumpt.	Up to 70% for family consumpt. and 30% for market	50% for family consumpt. and 50% for market	Up to 70% for market and 30% for family consumpt.	Mainly for market	No product.
Grain	50,9	9,4	7,9	5,9	5,4	20,5
Fruits	71,9	6,4	3,5	4,4	4,9	8,9
Vegetable	76,8	5,9	2,0	8,7	5,6	1,0
Milk (fresh)	25,2	8,5	14,4	13,9	23,2	14,8
Milk products	43,0	5,5	5,9	15,9	7,4	22,3
Meat (fresh)	15,3	11,9	9,5	35,1	25,7	2,5
Meat products	73,2	1,0	0,5	0,5	0	24,8
Honey	17,3	0	2,0	2,5	2,0	76,2

Source: elaboration of the author

Milk and meat processed products are predominantly produced for self consumption with the exception of Doboj and Trebinje area. This can be partially explained considering some successful stories like the "*sir iz mijeha*" (cheese in a sack) which has been recently protected through a *slow*

food presidium[7]. However on farm meat processing remains rare also because of the relevance of the livestock market within the Entity.

Overall more than the 40% of products are marketed through farmer markets while only a 20% of the farmers sell their products through a processing company or a distributor.

4.3 Credit

The credit system is not used by the majority of agricultural households (57.7%) however the most accessible institutions are Micro Credit Organization (MCOs) and NGOs while the presence of commercial banks is absolutely residual.

The major barriers to credit are the high interest rates required (MCOs and NGOs are more accessible since they offer better condition) and the request of significant collaterals that are considered as a major constraint in the 56% of the cases.

Overall credit has been used mainly for purchase of equipment, for the construction and modernization of buildings and other facilities, and for solving financial problems. Correlations between access to credit and access to subsidies have to be observed. Farmers who do not have access to subsidies usually do not have access either to credit or microcredit. Small size, age and low education level are among the main causes.

4.4 Subsidies

Overall more than 50% of the interviewed agricultural households have received subsidies, but relevant regional disparities have to be underlined. Subsidies have been received by the 65% of agricultural households in Doboj area and only by the 20% in Trebinje area. This diversity in subsidies distribution can be partially explained with the diversity of farm size within the regions: large farms in Banja Luka and Doboj receive the largest share of subsidies.

Table 3 - Access to subsidies 2006-2007

	%	Cumulate %
Subsidies received	51,2	51,2
No subsidies received	48,8	100,0

Source: elaboration of the author

The subsidy system is considered extremely complicated by a large group of households who find the main element of complexity in the fact that in the last years the system has been deeply modified on a yearly basis.

Moreover subsidies are extremely fragmented and fail to promote specialization or competitiveness. Considering that almost the 80% of subsidy recipients obtain less than 900 KM per year it is probably appropriate to recognize in agricultural subsidies more a social then a development purpose.

7 Slow Food: http://www.slowfood.com.

Table 4 - Subsidies received in 2007 (KM[8])

Subsidies received	Number of farmers (%)	Number of farmers - Cumulate %
No subsidies received	47,8	49,2
50-100 KM	3,4	52,8
100-200 KM	3,4	56,3
200-300 KM	3,9	60,4
300-400 KM	5,4	66,0
400-500 KM	6,9	73,1
500-700 KM	4,4	77,7
700-900 KM	2,0	79,7
900-1500 KM	3,9	83,8
1500-2000 KM	6,4	90,4
>2000 KM	9,4	100,0

Source: elaboration of the author

Table 5 - Subsidies/aim

Aim	Subsidies received (%)	Subsidies received - Cumulate %
No subsidies received	48,2	48,2
Purchasing of new equipment	2,0	50,2
Modernization of facilities	2,0	52,2
Purchasing of inputs (chemicals, seeds)	1,5	53,7
Production	36,9	90,6
Purchasing new eq + production	7,9	98,5
Modernization of facilities + production	1,0	99,5
Equipment+inputs	0,5	100,0

Source: elaboration of the author

A large majority of subsidies (70,5%) have been allocated exclusively to production, this is coherent with the agricultural policy instruments used in the 2000-2007 period basically aimed to the direct support of certain commodities (overall milk and tobacco). Apart for production there is a quite significant share of farmers (7,9%) who have received subsidies both for production and for the purchase of new equipment. Other categories (modernization of new facilities, purchase of inputs as chemicals and fertilizers) have been residual and did not have a significant impact at the farm level. A subsidy scheme mainly oriented to support production instead the purchase of new equipment or the improvement of the facilities fails in promoting a modernization process

A major criticism that farmers direct to the subsidy system is also related to its extreme complexity due to the lack of stability (in the past decade an overall strategy have been not foreseen and instruments were changed on an annual basis) and the extremely bureaucratic (for farmer's average knowledge) procedures.

8 KM = Convertible Marks. 1 KM = 0.511292 Euro.

4.5 Sectoral organizations and farmers associations

The majority (68%) of the agricultural households are not member either of a cooperative or of an association. The situation is largely common in transition countries, where agriculture cooperatives played a big role in former systems. In RS more that 300 "old" cooperatives are still formally existing and most of the cases they are not functioning but they are still in control of valuable and large properties. This situation has a significant impact on the farmer's perception of the cooperative system. So mistrust is still a major constraint for the creation of associations and of a new model of cooperative.

4.6 Demographic trends and family structure

Effects of war and changes in the economic system continue to support the lasting trend of migration of people from rural areas to economically more developed urban centers contributing to further erosion of rural households and their deteriorating age structure. Agricultural activities in the area are thus often limited and have mainly a subsistence or semi-subsistence character. The age structure reflect this considerations since families are characterized mostly by elders and so by people with less chances to find a better job in a more urbanized center or with a not so strong desire to move in search of a better life. Generally life and work in villages are made more difficult by the lack of adequate infrastructures and services.

Interviewed households are not extremely large since the 45% of them have between 3 and 4 members and the 78% less than 6 members.

4.7 Family income

Insufficient income from agriculture is result of low level of investment. Limited production contributes to high sale price by product unit for which reason local products cannot compete in the market with those imported from neighboring countries.

Considering the farmers included in the survey a significant variety of situations has to be underlined: income range from less than 300 KM per month (16,4% of the total population) to more than 700KM (17,2% of the total population) and it is almost equally spread in all the categories in between.

Table 6 - Income - Individual income (monthly)

Income	Individuals (%)	Individuals - Cumulate %
<300 KM	16,3	16,3
301-350 KM	5,8	22,1
351-400 KM	9,4	31,5
401-450KM	10,5	42,0
451-500 KM	14,0	56,0
501-600KM	10,5	66,5
601-700 KM	12,9	79,4
>700 KM	20,6	100,0

Source: elaboration of the author

Farmers and agricultural households' farm mostly part time and beside agriculture they are permanently employed or they have a temporary position in the service or in the industry sector. This situation is confirmed also by the fact that agriculture does not generally represent the majority of the income, but only an "additional source" to a salary from another sector or other revenues (i.e. a pension). More

than 50% of farmers gain less than the 60% of their income from farming activities and only the 15%-20% can be considered as professional farmers since they gain the large majority of their income from agriculture.

Off farm work is shared among services (20%), agriculture through work in other farms or companies (19%) and industry (13%). A significant share (35%) is unemployed or has access only to short term casual jobs (5%). Other revenues such as pensions (34%) and remittances (2%) represent an additional economic support for a significant share of farmers.

Overall a correlation between income and subsidies can be noticed: households with lower income do not receive subsidies or are anyway minor recipients.

5. Conclusions

A large majority of farmers seems to elude a commercial definition or orientation. Subsistence and semi-subsistence remain still largely the main orientation so that non commercial farms are still the most common production unit. This is emphasized also by several findings:

- farm size is predominantly small or really small (less than 5 ha) although if regional differences has to be highlighted;
- land ownership is still under a transition process so that the land market is affected by a significant stagnation due to the uncertainty of the property and to the lack of investments and long term strategy at the governmental level. This situation give not any incentive or adequate support to the farmer to move from a subsistence to a more market oriented production;
- there is an overall lack of investments both in physical (outdated machinery, lack of machinery and other facilities) and human capital (the level of education is generally low as well as the overall availability of vocational training);
- production is extremely diversified and based on labor as main input so that the overall productivity is significantly low;
- access to credit is at a very low level due to the high interest rate required and to the request of significant collateral by the credit institutions. Moreover the overall perception of the risk is very high so that farmers are reluctant to invest or ask for credit even in case they would have the chance to do it;
- subsidies are often too small to be attractive (so that the system results to be too complex also due to its scarce economic attractiveness) and do not have a significant impact on farming activities. Overall subsidies are too fragmented to promote specialization and competitiveness and so to support an evolution of the "farmer" that at the moment find in the subsidies, and overall in the agricultural sector, a social support;
- policy measures are mainly focused in supporting production and fails to stimulate innovation and change. Stronger emphasis could be dedicated to credit programmes for small-scale agriculture or to the improvement of rural areas through technological modernization and social infrastructures;
- associations and cooperatives are not developed. Also because of this farmers have no influence over legislation and regulation for agriculture in the sense of adopting new stimulative measures contributing to higher living standard of rural population and stopping rural migration;
- rural migration is significantly high especially among younger generations. The lack of services, infrastructure and of public investments in rural areas do not create any alternative economic opportunity so that the labor force is often forced to migrate often leaving farming activities to the elder members of the family or keeping on farming part

time during week end and so failing in creating a class of specialized farmers;
- farmers are generally elder and younger farmers perform agricultural activities only part-time also due to the lack of economic attractiveness of the agricultural sector.

Most of these elements can be considered major constraints in promoting competitiveness and innovation. However even if subsistence farming represent a barrier for the modernization of production schemes, it is also true that they do provide a significant social function and that they do represent an important social safety net especially in rural areas and in the rural-urban fringe due to the lack of economic opportunities.

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DEVELOPMENT OF HUMAN CAPITAL AS A TOOL FOR IMPROVING PRODUCTIVITY OF AGRICULTURAL SECTOR –CASE OF SERBIA[1]

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Abstract

New trends in global economy require greater capacity of the agricultural workforce. In order improve agricultural productivity it is needed to increase the level of human capital of the agrarian population. Human capital is accumulated knowledge, created in the long term process of human resources development, which begins in early stages and last all through the life, which is especially true for agricultural business. During transition Serbian economy went through major changes, with agriculture trailing to other sectors of the economy. Each farmer is producing only around 3,000 € gross added value per year, which is substantially lower than in other sectors. This paper will analyze what innovative activities are used worldwide in agriculture and give some possible solutions for investments in human capital and development of human resources in order to increase the level of competitiveness. Finally we analyze Serbian agricultural education system and give some instructions for improvements,

Key Words: agricultural sector, productivity, human capital, education, reform

Competitiveness in Agriculture

Enhanced productivity and increased levels of production in agriculture are needed in the current spike of economic crisis threatening global efforts to reduce poverty. Greater commercialization of agricultural systems and increasing trade liberalization dictate a need for greater capacity on the part of the agriculture workforce and rapid increase of productivity. Productivity is a synonym for competitiveness in agriculture and it can be increased by introduction of new knowledge, investments and growing efficiency of production.

Due to scarce statistical information from Serbian economy, in this paper we have used the change in gross value added as a tool to derive change in productivity. By using data of gross value added and the number of employees we have calculated gross values added per employee in different sectors of Serbian economy, as seen in table 1. Among lowest in nominal values, each employee in agriculture creates value added of around only 3,000€ per year. Productivity level in agriculture which initially increased in 2006 has rapidly fallen during two following years, so that average productivity dropped by 1% in agricultural sector over period of 4 years.

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Table 1 – Gross yearly value added per employee at basic prices, 2005-2008 (in 2002. dinars)

Economic sector	2005	2006	2007	2008
Agriculture, hunting and forestry; Fishing	*214133*	*252094*	*227250*	*206159*
Non-agricultural sectors	*329539*	*339635*	*350331*	*365840*
Mining and quarrying	488943	543641	408924	517128
Manufacturing	330558	334807	348905	366830
Electricity, gas and water supply	583516	548184	598992	612064
Construction	208014	234356	250574	250538
Services sectors	*454577*	*503835*	*555953*	*582177*
Wholesale and retail trade	275337	303550	370533	375609
Hotels and restaurants	111109	96612	121144	111222
Transport, storage and communication	714353	932431	992672	1144137
Financial intermediation	1420798	1681166	1981359	2265165
Real estate, renting and business services	2108087	2184871	1767482	1820535
Other services	290254	295086	304676	308374
Total	364016	404019	426995	432713

Note: 1€ equals 60 dinars (in 2002 prices)

Source – own calculations according to Serbian Statistical Office

In Serbian economy there were significant changes during transition, which resulted, according to official data of Statistical Office of Republic of Serbia (2008) with share of agricultural sector in creation of gross value added to fall from initial 15.1% in the year 2002 to 11.5% in year 2008. Such results show that there is a need for change.

Global Innovative Activities

As noted before, modern agricultural business needs to adapt to changes on the global market in order to become more competitive. Efforts to increase productivity include innovations on several levels: policy, institutional, program and household level.

At **policy level** governments are required to promote educational systems that are open, flexible and capable to compete in current global economy. Three major trends are occurring in developed economies during last few decades.

First, a shift from public to private institutions (universities, advisory services and media) was promoted. In Serbia that is still not the case, because most institutions are still state owned. Global shift of power from public to private in agribusiness development, made governments worldwide to recognize private sector as important and establish close links with tem as their primary partners.

Second, definitions of rural policy with their policies and programs have been evolving. Instead economies of scale firms today compete by giving more attention to quality, productivity, and flexibility to adapt to dynamic and diverse markets and rapidly changing technology. Schultz (1981) developed concept of human capital and found that US farmers had greatly increased output with less land, labor, and capital mainly by working smarter. Schultz also demonstrated that the returns to human capital were higher than the returns to physical capital.

Finally, increased importance of human capital brought institutional reforms. In EU the Common Agricultural Policy (CAP) has since adoption in 1992 undergone through enormous changes.

Trade-related concerns have been highly influential in this ongoing reform process with other factors also helping change the CAP in a second way, with the CAP now embracing a wider range of goals and instruments. The positive approach and its emphasis on jointness implies that multifunctional policy goals can be achieved through policies aligned directly with farming activities (Ramniceanu, Ackrill 2007).

At **institutional level**, agricultural education "system" institutions must continue adapting to the changing environment and needs of the sector. That can be made by a better fit between the supply of trained workforce and a demand that is constantly changing; flexible approach to occupational profile of trainees, to cater to the needs of a changing and advanced technology; placing emphasis on training for productivity improvement; and finally on reform in the infrastructure of educational and training institutions and programs, especially as regards their relevance to a changing world and their effectiveness in it (Rivera & Alex, 2002). On the same time firms and individuals have only two basic choices in increasing competitiveness: lower costs, mainly wages; or increased value added over increased human capital (Marshall 2001).

At **program level** there are several innovations required. Program sustainability implies to the fact that education at extensions, media, formal and non-formal courses does not last forever. After its completion, it is necessary to provide monitoring and evaluation which will focus on results and client satisfaction. In that way it will be possible to measure the effectiveness of education and training made in the past. Development oriented training should go beyond the teaching of research and extension staff and management. Basic education must include elements of new technologies like biotechnology, e-technology and others, which cover managerial issues, risk management and market requirements. These varied educational areas will eventually lead to wider knowledge of agricultural workforce, so enabling them to understand how to become competitive on the market.

At **household level** the incentive of a rural household to change its farm organization is determined by the trade-off cost and expenses characterizing each of the farm types. For example, the advantages of individual farming include lower transaction costs associated with reduced inefficiencies. Unlike that, mass farming organizations may achieve economies of scale in risk management, input purchasing and marketing. Leaving collective has its 'entry costs' to start up an individual farm. These costs are affected by institutional reforms and market liberalization processes.

While the role of capital market imperfections during transition has been well recognized, no study formally models or empirically estimates the impact of human capital on the agrarian structure in transition economies. An improved understanding of the impact of heterogeneity of economic agents on the agrarian structure would allow the design of policies that enhance both farm efficiency and regional development.

In general all four levels of innovations include improvement of human capital. To be able to correctly and efficiently organize development of agrarian human resources, we have to look at the structure of workforce and educational systems.

Sources of knowledge in agriculture

Since Becker (1964) and Drucker (1968) researches, knowledge is recognized as a fourth economic pillar alongside those of land, labor, and capital. In a knowledge economy, resources such as skills, expertise, and intellectual acumen are often more critical than other economic resources such as land and labor and even capital, because it is difficult to measure its levels.

Increase of productivity based entirely on reduction of workforce and lower wages, which has often been the case in transition countries, is not sustainable in the long term. For that reason we will target on increase of human capital levels as a tool for increase of productivity. Human capital determines farming and, in general, managerial skills of rural households. Workforce in agriculture may be divided in four major categories. They include:

- workforce currently employed in agriculture
- self-employed or working on farms
- workforce preparing to enter the workforce and
- workforce in transition from one agricultural job in farming or support services to another.

According to Rivera (1998) the entire above named agricultural workforce is educated through a variety of educational systems, and they are:

- Formal agricultural education, science, and technology system of curricula provided by mainstream education institutions
- Non-formal agricultural and extension education system of programs provided to farmers and rural audiences through knowledge-transfer services
- In-service training and development system of programs provided by private organizations and public agencies for their employees
- Mass-media/distance learning system that provides an independent and continuous supply of information

Such division of labor and educational systems in agriculture served to Rivera and Alex (2008) to create framework of the process of creation of human capital in agricultural systems, which is presented in Table 2.

Table 2 – Sources of knowledge for different workforce in agriculture

		Sources of knowledge			
		Schools	**Extension Services**	**In-Service Training**	**Mass Media and Distance Learning**
Categories of Agricultural Workforce	**Unemployed**	Curricula and programs	Special youth programs		
	Farmers		Advisory and training programs	Market	Rural magazines Tele-centers
	Institutional Support Personnel		Training for private extension personnel	Agricultural in-service training and study tours	Distance learning and certificate programs
	People in transition	Adult education Vocational skills development			Distance learning and certificate programs

Source: Adapted to Rivera and Alex (2008)

Each educational knowledge source needs to remain vigorous, but at the same time it is important in these knowledge and information providers to develop networks and linkages. Agricultural schools have their programs, universities have their curricula, but it is not

enough to complete school to be competitive. Education is a life long process which needs to be continued outside of formal education and training systems, through private and public workforce organizations (i.e., the shadow education system), and the non-formal educational support programs-such as the acquisition and transmission of rural knowledge and innovation.

Training is important to build individual capacity to operate effectively within the sector as well as to build specific capacity in individuals to further organizational objectives. For the latter, training must align with an organization's goals in the form of development-oriented training, not ad hoc or survival-type training (Gooderham & Lund, 1992). Agricultural education and training institutions need to extend their curricula by developing courses that in addition to agricultural production provide relevant education and training in areas such as agricultural business, farm management, entrepreneurship, marketing, organizational skills and knowledge, management, and program development. This is a new concept which tends not only to create agricultural specialists. It rather makes a trend where completed agricultural scholars are able to participate on the market, be productive and have entrepreneurial initiative.

Serbian Case

Serbian agricultural educational system is organized in a set of agricultural schools and faculties. Complete educational system is under supervision of Ministry of Agriculture which is responsible for formulation and implementation of educational programs. Unfortunately there is no clear strategy which would define curricula that would connect formal education and real market needs in agriculture. Curricula in secondary and tertiary educational institutions need to change and include subjects that cover market needs like management, planning, trade and marketing. It is also crucial to introduce environmental courses and integrate them with contemporary knowledge in informational technologies, social sciences and humanities.

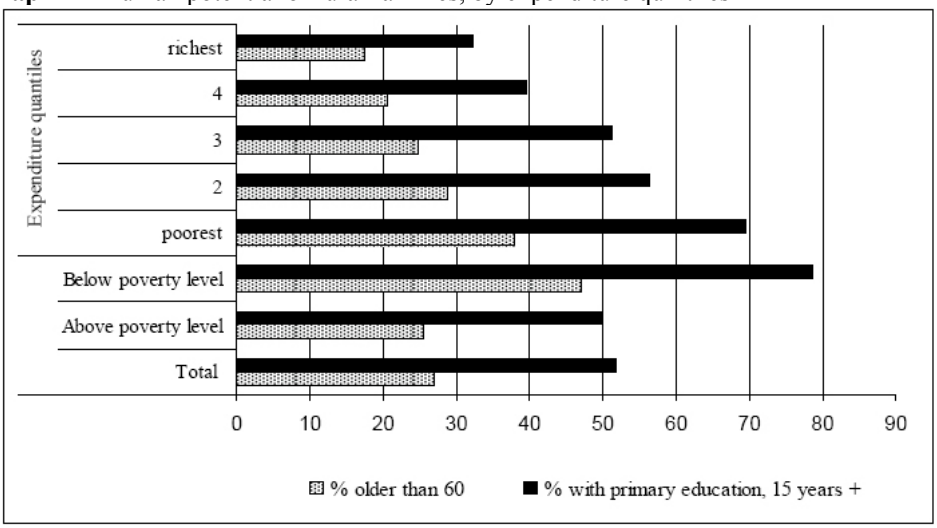
Agricultural schools in Serbia are mostly oriented on education and training of agricultural technicians, low level managers in agricultural companies and for public services. Most of the land is, however, harvested by small family farms. It is needed to adapt educational programs in schools to serve private agricultural sector. Most of the countries in transition have already successfully implemented the change, and Serbia may use their positive and negative experiences for overcoming its own market failures. More attention has to be placed on agriculture management and practical skills. It is necessary to build such an educational system that will satisfy the needs of modern market economy and perform a scanning of complete agricultural educational system, and moreover, as noted before, allow privately owned schools in this sector (Government of Serbia 2005).

According to Ministry of Agriculture (2004) most important for human capital are employees' qualification structure and the level of knowledge they have. Qualification structure of productive workers in Serbia is adapted to mass production, which is inherited from the socialism period, instead to specialist production which requires higher level of competences and continuous training. Despite global reforms in education, there are no indications that there is a planned concept of education and specialist training of rural population.

According to 1998 census of population, nearly half of Serbian population is living in rural areas. Compared to previous censuses younger population is moving from rural to urban areas. In graph 1 we can see the level of human capital amongst rural population. It is visible that

population belonging to lower level expenditure quintiles are mostly older than 60 years of age and have only primary education or less. This proves the necessity of making efforts to increase education level, especially training and lifelong learning for adult population.

Graph 1 – Human potential of rural families, by expenditure quintiles



Source: Serbian Statistical Office (2008, pg 145)

Efforts made by governmental and non-government organizations to perform fundamental changes in complete educational system should as the effect make balance on the level of quality of education in rural and urban areas. Increased quality of education should support the process of sustainable rural development and suitable for urban population. During transition in Serbia, there is a significant decrease of industrial production, companies are going bankrupt, which as a result decrease of employment of rural population who were not involved in agricultural operations. Attention has to be made on orientation to market needs, shift from industrial to agricultural production, and stimulation of education and training and adoption of knew competencies of unemployed population.

Conclusions

Training and education is a life-long process. For that reason we must look at all levels of that process, from policy makers to households. We must understand that changes in education program and holding seminars for improvements in food industry are not sufficient. Education is required for a person to be well organized in food industry, but not enough for the knowledge to be applied efficiently. Training in house is essential for enhancing acceptability of education, followed by a wide span of other knowledge sources.

Centralized and authoritarian approach to education, which was present during last few decades, has to be the core of reforms, allowing private capital to enter and improve its quality. Current reforms in agricultural schools have to lean on curricula which combines teaching and practical training of local farmers, and especially on continuous education of elderly population. An accent has to be placed on solving high unemployment levels among rural population, with reorientation of human resources by offering them several training programs that would help increase

productivity of agrarian sector which is at present trailing in Serbian economy.

Low levels of human capital in agrarian sector, with over 50% of rural population having only primary education or less are the key reason for low productivity and weak competitiveness of the sector. Urgent institutional reforms are crucial for agrarian sector to achieve sustainability in the long term, and not become the black hole of Serbian economy.

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BIO-ENERGY FROM WINERY BY-PRODUCTS: A NEW MULTIFUNCTIONAL TOOL FOR THE ITALIAN WINE DISTRICTS

Diego Begalli[1], Stefano Codurri[2], Davide Gaeta[3]

Abstract

This paper aims to investigate if the legislation will allow the production of energy from winery by-products and how this can contribute to multifunctionality of the wine makers' income. A medium size winery was selected and an anaerobic digestor process was simulated using the company's data. The main methods of financial evaluation were studied to create information to see if the project concepts were valid. The results highlight the positive level of earnings that the project will generate due to the high level of methane included in the pressings that could be transformed in energy, the short period needed for obtaining methane and the recent substantial level of government support both in Green Certificates and financing of the initial cost of the investments.

Key words: Biomass, winery by-products, multifunctionality, energy, wine district

1. Introduction

The growing interest of the International Community concerning the consumption of energy and its effects has created the Kyoto Protocol[4]. Until the recent energy crisis of 2008 which caused the enormous petrol price fluctuation the function of agriculture in the energy framework has been grossly under evaluated. Agriculture can play an important strategic role, giving multifunctional services to the European Community[5].

The need for renewable sources of energy is continuously more evident as the supplies of fossil fuels are being slowly consumed. At present it seems that biomass can not completely substitute fossil fuels. The advances of scientific research and the progressive miniaturisation of biomass energy plants are making a new scenario for the agricultural industry. The continued search for new sources of income by the farmers has now taken on a new dimension. Farmers can now decide if it is economically viable to produce, transform, sell and eventually manage the energy network. At the same time contribute to improve the green economy.

This energy opportunity is a great input for the Agriculture Common Policy. Agenda 2000, the Fischler Reform and the Biomass Action Plan highlight the importance of these new energy tools.

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4 In the vast literature on the argument is noted "L'impresa agroenergetica", AA.VV. Gruppo 2013 (2009).

5 The E.U. is the main consumer of energy after the U.S.A. Starting from 1990 the increasing annual rate of consumption is 0.55%. The 25 member states of the E.U. buy 54% of the energy that they consume from outside the community; petrol 42%, natural gas 23%, electricity 21% and renewable energy counts for 5%. Renewable energy in the E.U. is expected to produce 10% of the total energy consumed in 2020 and 13% in 2030. Energy contributes 80% of the total green house gases (GHG) emissions.

The E.C. Regulation 1782/2003 that recognizes the energetic function of agriculture considering the use of vegetal biomass, agricultural waste products – worked and un-worked – as models to encourage. Other energy opportunities have been created by other legislation tools[6]. The recent Italian bill of Parliament (D.D.L. n. 1195-B) approved July 9th that will become effective in a short while allows farmers to obtain public support, also for the initial costs of the investment. These incentives are therefore cumulative with specific government support recognized for the production of electric energy from biomass.

Although the policy framework urges the development of energy from renewable resources the cost analysis and financial benefits to the farmers are not yet clear. The uncertainty concerning the profitability of the investments and the generation of new income is still to be evaluated. This situation tends to create an investment speculation bubble[7]. From an economic point of view the cost-benefit model is restricted by public support and fixed prices.

2. The aims of the research and the reasons for the choice of the wine sector

The aim of the paper is to evaluate through a concrete case study the validity of investing in an energy plant to recover enological by-products for the production of energy. Here it is proposed to utilize the pressings of grapes in a biomass power plant to produce electric and thermal energy.

There are defined reasons for the choice of the sector and the resources to be transformed into energy. In the wine sector there are some unresolved problems which the present paper wishes to highlight and discuss. On the other hand there are emerging factors that could be very important for the production of biomass energy from wine by-products.

Positive factors are represented by:

- in 2013 contributions for the distillation of wine pressings will finish (wine C.M.O.);
- public incentives for the agro-energetic sector were previously at the national level. Now the legislation has changed and local government bodies are responsible, making the system more user-friendly for wine producers;
- competition in the improvements in the quality of wine has caused the dramatic increase in heating and refrigeration costs for wine, lowering profit margins;
- the economic crisis has reduced sales and prices;
- the price of pressings of prestigious wine (in this case Amarone) has been reduced because the spirits market is at an all time low[8].

Negative points are represented by:

- the present use of enological by-products and the control of them by the Common Market Organisation (C.M.O.) regulation that obliges all producers of wine to give them to

6 The recent Health Check of November 2008 reconfirms the "decoupling" that induced the energy culture. The Green Certificates and the transfer of public incentives destined for the agricultural industry who produce new renewable energy sources have been moved from the first to the second sector of the Common Agricultural Policy. The Rural Development Plans are one of the main economic programming instruments to encourage agro-energy (note the measures 121, 123, 311, 321). Following the Health Check, the challenge of agro-energy has obtain ulterior importance in the policy of the second sector. Foreseeing with the E.U. Regulation n. 74/2009, the obligation of revising the Plan of National Sustainability (PSN) before June 2009 to include into regional plans the support of projects in the field of renewable energy.

7 See Vaciago (2008).

8 In the case of Amarone pressing the price changed from 111 euro per ton to 11 euro, which is the price for the normal pressings.

authorized distillers; recently E.C. Regulation 479/2008 allows the by-products of wine to be used for energy;
- the wine sector compared to other agricultural sectors has not needed to search for other incomes because of the high profit margins linked to the value of the products;
- the multifuncionality related to the wine industry such as agri-tourism, restaurants, etc. have been much more synergic to the production system than the production of energy;
- the difficulties linked to the supply chain, transport and plant costs, the organisation of new unknown technology, poorly defined regulation concerning permits are factors that create suspicions in the wine industry.

The pro's and contro's for the investment in biomass energy plant seem to be balanced but in reality the positive policy attitudes completely change the scenario showing that pressings are an important income tool.

3. The legislative and economic framework

The E.C. Regulation 479/2008 concerning the common market wine organisation that modifies the previous E.C. Regulation 1493/1999 will become effective on August 1st 2009. The use of wine pressings is seen, from the policy makers' point of view, as a potential threat for human health, market competition and environmental pollution[9]. For this reason the E.U. legislation has always foreseen as a general rule the withdrawal of the by-products of wine making and other operations which transforms wine grapes. This action is controlled as laid down by art. 12 paragraph 2 of the E.C. Regulation 479/2008.

As well as the above legislation, E.C. Regulation 555/2008 allows the distillation of the by-products as an alternative method. Article 23 section 7 of the above mentioned legislation permits the member states to oblige the wine makers to supply to the distillers all the by-products of wine making. Article 26 section 8 is a legislation concerning particular cases in which wineries destine pressings to produce spirits. This framework is summarised in figure 1.

As you can see Italy has opted for a mandatory distillation system. The wine makers are obliged to take their by-products (pressings and dregs) to the distillery and thus the distillery is obliged to take the by-products. When the pressings and dregs are consigned to the distillery it is decided which disposal process to use.

The first process, concerning only pressings, which are distilled into spirits (grappa). European legislation has fixed for Italian farmers a support equal to 450 euros per hectare in 2009 lowering to 350 euros per hectare in 2012 when the support finally finishes. The second process, concerning dregs and pressings, which produce industrial alcohol and/or energy. In this case the support is paid to the distillers which transform the by-products into raw alcohol that has an alcohol level equivalent to 92% volume[10].

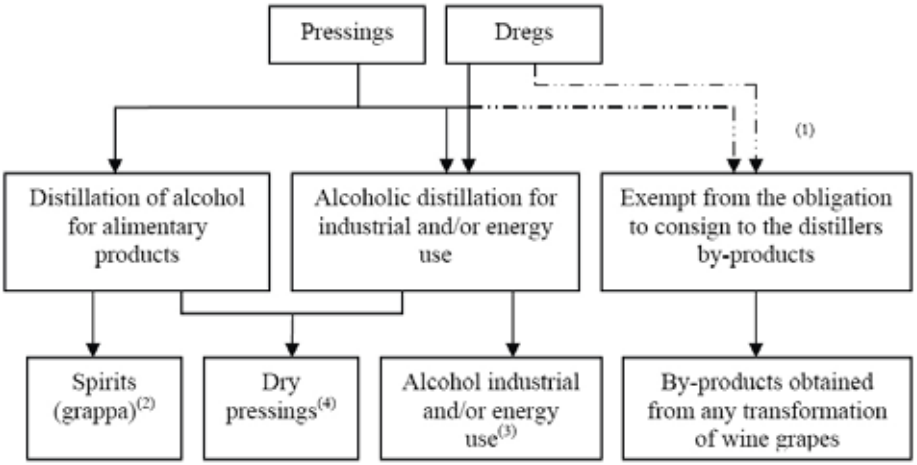
Here emerges a big difference concerning the previous wine C.M.O. The minimum price

9 Italian legislation prohibits the by-products of wine to be used as natural fertilizers in the fields (according to D. Lgs. 217/2006) or as rubbish (according to D. L. 99/1992).

10 Italy has fixed the entity of help equal to the maximum level consented 1,1 euro/%vol/hectolitre for raw alcohol obtained from the pressings and 0,5 euro/%vol/hectolitre for raw alcohol obtained from the dregs. The cost of transport is fixed at 0,016 euro/Kg and is included in this price. They should be transferred from the distillers to the producers if they carry out the delivery.

guaranteed by the E.U. to the producers for the distillation of by-products finalised to industrial and/or energy use was eliminated. Therefore because there is no longer financial support from the E. U. the price of pressings and dregs are much lower than in the past. After the distillation process the pressings can not be used to make other wine but a solid mass of pressings remains. This part is generally used by the distillers to produce compost and fertilizers, animal feed or fuel[11].

Figure 1 – New opportunities for by-products distillation



[1] Option suggested by the Authors to derogate from the obligation of distilling according to Ministerial Decree n. 301 December 27th 2008.
[2] Support recognised to the wine cellars according to art. 26 E.C. Regulations 555/2008.
[3] Support recognised to the distillers according to art. 24 E.C. Regulations 555/2008.
[4] The dry pressings are considered as by-products according to Law n. 208 December 30th 2008 and are not subject to the legislation on rubbish.

This actual situation concerning the management of winery by-products could be modified by new Italian regulation. Art 5 D.M. 301 December 27th 2008 presents a list of cases whereby the wine makers are not obliged to give by-products to the distillers[12]. On the basis of the above legislation new opportunities for wine makers have arisen. Now the question is if it is worthwhile from an economical, social and environmental point of view for the wine makers to create bio-energy or to maintain the present by-products disposal system.

4. Methodology and the process the used in the case study

The winery where the analysis has been conducted is situated in the Valpolicella wine district. This case study has been selected for different reasons. It is a medium size wine cellar (70 hectares of vineyard) that represents a model that can be easily adapted for other

11 For this purpose the art 2-bis of the Law n. 205 December 30th 2008 declares that dry pressings and their components derived from the process of vinification and distillation are considered by-products as fixed by the D. Lgs. n. 152/2006 (Unique Text on the Environment).

12 The producers actually "are exonerated from the obligation of consigning, but are obliged to have the products removed paying disproportionate duties". The category that enters in this above mentioned list are individualised by a governmental directive.

wine growing areas in Italy. As well as commercialising different product lines (amongst which are the prestigious brands of Amarone and Recioto) the winery processes wine on behalf of other wine producers. The size of the activity allows the winery to use state of the art technology.

Amongst the different technology available for the valorisation of energy starting from wine by-products, has been selected the anaerobic digester process for the production of biogas from pressings. The advantages that this process allow are linked to: i) the production of biological methane and humus; ii) the total recovery of carbon dioxide; iii) the elimination of extra ecological pollution with the stabilization of organic substances; iv) the recovery of water in the biomass.

To reach the objectives proposed in this paper a private cost-benefit analysis has been utilized. As argued by Campbell and Brown (2003), the financial analysis is a common technique from which a business can choose different alternative projects.

The private focus is coherent with the European farmers' multifunctional role and it is justified by the farmers' continuous search for new incomes. The multifunctional agriculture issue is often linked to public goods (environment, occupation, health, etc.) because their intrinsic value can influence the feasibility of projects. Moreover, according to the literature summarized by Sen (2000), the application in the case study here considered by a general cost-benefit approach struggles with the need to give a value to different public goods (some of them with widespread effects) through the usual market mechanisms. The aim of reducing uncertainties only takes into account, benefits and costs that have a present or future market value.

Three valuation methods have been used. Firstly, the Net Present Value (NPV) formula[13] has been adopted to actualise the cash flow of the project. Secondly, with the Internal Rate of Return (IRR) technique[14] the return for the capital invested has been calculated. Thirdly, the Pay Back Period (PBP) method[15] has been utilised to calculate the number of years in which total expenditure is covered by positive cash flows.

5. Results

Table 1 presents the data of the process of an anaerobic digester of pressings. It is shown that this biomass typology gives two advantages. The first concerns a short period of the process (21 days) compared to the standard 40-60 day necessary for the digestion of cow sewage. The second concerns the higher concentration of methane (80-84%) compared to the standard 64% of cow waste.

The expected specific electrical production is equal to 300 kWh per ton of pressings and it is based on laboratory estimation (Araldi *et al.*, 2009). This is a low estimation but it is believed a larger plant will produce much more energy than the estimated figures. The expected electrical production is estimated equal to 239,400 kWh/year, while the expected thermal production, taking into account auto-consumption, is estimated equal to 311,220 kWh/year.

13 Net Present Value (NPV)= $\sum_{t=1}^{n} C_t/(1+i)^t$ where: *t* represents the expiry date; C_t is the positive/negative financial flow at the time t; *i* is the discount rate of the operation

.

14 The IRR is calculated by solving the equation NPV=0 in observance of the variable *i*.

15 The PBP is calculated by solving the equation NPV=0 in observance of the variable t given a fixed rate *i*.

Table 1 – Availability of pressings and expected energy potential of the case study

	Quantity	Unit of measurement
Availability of pressings	798	ton/year
Expected specific electrical production	300	kWh/ton
Expected electrical production	239,400	kWh/year
Expected thermal production	311,220	kWh/year
Biogas yield	160	m^3/ton
Methane concentration in the biogas	80-84	%
Duration of the process	21	days

Source: Elaboration of company data

The pressings production is concentrated in the months August-October when the first stage of wine making is finished. In the Valpolicella district wine making usually continues until the end of February. This long production time scale helps resolve certain problems linked to the pressings storage activity. Basis on the data reported in table 1 the installation potential of the processing plant is hypothesized at 55 kWh which is the right size for internal consumption for a period of 6 months a year (Reggiani, 2009). The process will be started with the first pressings of white grapes at the end of August. The production of biogas will produce energy for the wine cellar in October. The thermal energy in that period is used to keep the temperature of the tanks at a constant level and for hot water and heating needs.

Table 2 presents the estimation of the energy production of the plant and the energy consumption of the company in the period September 2008 – March 2009. As can be seen, a higher level of energy consumption is characterised in this period. The climate conditions in the Valpolicella district and specific wine making techniques create the need for higher energy consumption. It concerns costs that are extremely high for the company budget about 120,000 euro a year for electricity and about 18,000 euro a year for thermal energy. About 70% of the electricity needs and 100% of the thermal needs will be met by the biomass plant in the considered period.

Table 2 – Comparison between plant energy production and winery energy consumption during the period of vinification

Period	Quantity equiv. biogas (ton)	Prod. energy el. (kWh)	Consum. energy el. (kWh)	Prod. energy thermal (kWh)	Consum. energy thermal (kWh)	Cover el. needs (%)	Cover thermal needs (%)
Sept.	-	-	84,554	-	20,124	-	-
Oct.	163	40,777	135,440	53,010	81,478	30	65
Nov.	163	39,462	95,485	51,300	51,333	41	100
Dec.	163	40,777	422	53,010	60,776	-	87
Jan.	103	40,777	69,321	53,010	40,554	59	100
Feb.	103	36,831	15,987	47,880	71,846	230	67
Mar.	103	40,777	29,055	53,010	31,676	140	100
Total	798	239,400	345,710	311,220	357,787	69	100

Source: Elaboration of company data

Table 3 presents the flow sheet of the project. The energy produced will be entirely used to cover the energetic needs even if in some months of the year electricity will be sold to the net at an estimated price of 0.095 euro/kWh. The majority of annual revenues come from the sales of Green Certificates which are calculated on the base of the biomass energy produced.

In this case instead of the market price received from the Green Certificates contribution these have been substituted by the tariff "everything included" consented by the bill of the Italian Parliament D.D.L. n. 1195-B approved by the Senate July 9th. The cost of electricity including the tax is estimated at 0.18 euro/kWh, while thermal energy is calculated at 0,05 euro/kWh.

Table 3 – Expected annual revenue of the investment

Period	Prod. energy el. (kWh)	Consum. energy el. (kWh)	Revenue from tariff "everything included" (euro)	Revenue from selling el. (euro)	Revenue from not buying el. (euro)	Revenue from not buying thermal energy (euro) (1)
Sept.	-	-	-	-	-	-
Oct.	40,777	135,440	11,418	-	7,340	2,651
Nov.	39,462	95,485	11,049	-	7,103	2,565
Dec.	40,777	422	11,418	3,834	76	2,651
Jan.	40,777	69,321	11,418	-	7,340	2,651
Feb.	36,831	15,987	10,313	1,980	2,878	2,394
Mar.	40,777	29,055	11,418	1,114	5,230	2,651
Total	239,400	345,710	67,032	6,927	29,966	15,561

(1) Estimated values

Source: Elaboration of company data

Table 4 presents the estimated investment costs. The initial cost of the plant (385,000) is obtained multiplying the specific electrical potential installed (55kW) by 7,000 euro/kWh (average cost indicated in literature for plants of this type, Reggiani 2009). In the estimation of annual maintenance cost (8,000 euro) are also included administrative costs. A part time employee is needed whose costs are estimated as 17,500 euro. The EBITDA is equal to about 94,000 euro. From the data it can be seen that almost 56% of annual revenues generated by the project are obtained from public support[16]. As has been noted, the choice of the disposal of pressings in the wine cellar for the production of energy results as being much more convenient for wine makers compared to the option of consigning to a distiller. From the sale of pressings to the distiller the winery has obtained only 8,768 euro in 2008 which is much less than 94,000 euro of EBITDA that the company can obtain using the pressings.

Table 4 – Investment costs

	euro
Initial cost of the plant	385,000
Annual maintenance cost	8,000
Annual personnel cost	17,500
Expected total annual revenue	119,486
EBITDA	93,986

Source: Elaboration of company data

The financial evaluation of the investment, presented in table 5, is the results of the following hypothetical conditions:

16 56% is calculated dividing revenue from tariff "everything included" by expected total annual revenue.

- public support is equal to 40% of the investment according to the bill of the Italian Parliament D.D.L. n. 1195-B;
- average annual cost of energy and revenue from sales of electricity during the 15 years of the investment are equal to a rate of +1,5% annually (Nova, 2009);
- capital debt rate equal to 7,5% annual and hypothetical inflation cost equal 2% annual;
- tariff "everything included" equal to 0,28 euro per kWh produced from biomass;
- hypothesis zero revenue from pressings withdrawn by the distillery;
- internal consumption equal to 70% of electricity produced;
- duration of the investment is equal to 15 years.

The winery must invest only 231,000 euro compared to the original figure of 385,000 to start the project. The Net Present Value (N.P.V.), measuring the actualised value of the plant, is greatly positive (570,804 euro) compared to 385,000 euro (tab.4). The Internal Rate of Return (I.R.R.) is stated at 68% and is completely unreachable if compared to other investments with the same risk level. The Payback Period, which measures the break-even time of the investment, is equal to 2,5 years. It can be considered a very good result.

Table 5 – Financial evaluation of the investment **with** revenue generated by the tariff "everything included"

Evaluation Methods	
Net Present Value (NPV)	570,804 euro
Internal Rate of Return (IRR)	68.0 %
Payback Period	2,5 years

Source: Elaboration of company data

Table 6 – Financial evaluation of the investment **without** revenue generated by the tariff "everything included"

Evaluation Methods	
Net Present Value (NPV)	32,837 euro
Internal Rate of Return (IRR)	10.0 %
Payback Period	8,7 years

Source: Elaboration of company data

From the comparison of the results of table 5 and 6, it is shown that, as expected, bio-energy from winery by-products is highly profitable only with public support. If the revenue generated by the tariff "everything included" is not taken into account or the plant is not supported in the initial costs (as it was before the bill of Italian the Parliament D.D.L. n. 1195-B) the financial convenience of the investment is not so evident. The N.P.V. without the support offered by the tariff "everything included" is still positive (32,837) but much lower than before. The I.R.R. from 68% goes down to 10% and the Payback Period goes from 2,5 years to 8,7 years.

6. Conclusion and suggestion for further research

This analysis is based on an alternative interpretation of Italian legislation concerning the use of wine pressings and new opportunities offered by the recent bill of the Italian Parliament D.D.L. n. 1195-B allowing public support of the investment initial costs. For this reasons the paper has indicated the following positive points linked to the model:

- thermal energy, which usually is more a problem than an advantage in biomass plants

because it requires an accumulation system, can be a helpful support in the wine cellar production;
- biogas made from pressings is higher in methane than from other agricultural by-products and it is available in a short period;
- high level of earnings is guaranteed as long as the substantial level of government support will be assured due to positive externalities function of the agriculture activities.

At a policy level the main implications are represented by:

- reducing energy costs will create more competitiveness for the Italian wineries;
- the multifunctional level of the wine makers will increase if, as has been suggested in the present paper, the E.U. legislation will allow the use of pressings instead of delivering to distillers.

Future research opportunities are:

- the production of a bio-energy model that can be easily adapted for a network of wineries in the wine district;
- not only pressings but other wine sector biomass products can be inserted into the model;
- the biomass project will be integrated researching into the compatibility of other technology (e.g. electrical solar panels);
- the model could be studied for both public and private partnership projects;
- the analysis of the impact of this kind of project on the well-being of the local community (environment, occupation, health, etc.).

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BOUNDARY ORGANIZATIONS: AN EFFICIENT STRUCTURE FOR MANAGING KNOWLEDGE IN DECISION-MAKING UNDER UNCERTAINTY

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Abstract

Modern environmental issues imply that decision-makers take into account opinions from experts of different spheres. Boundary organizations are institutions able to cross the gap between different areas of expertise and to act beyond the boundaries while remaining accountable to each side: by encouraging a flow of useful information, they permit an exchange to take place while maintaining the authority of each side, in order to provide a better knowledge and understanding of a situation characterized by uncertainty. Though never formally proved, this hypothesis is widely accepted based on the observation of existing boundary organizations. Through a multi-agent simulation, it is possible to assess their impact on the diffusion of opinions among experts. This virtual interaction of heterogeneous agents based on a model of continuous opinion dynamics over two dimensions, shows that boundary organizations have a significant quantitative impact on the diversity of opinions expressed and the number of experts agreeing to each emerging position.

Key words: boundary organization, opinion, knowledge diffusion, multi-agent system

Modern environmental issues, characterized by uncertainty and complexity, imply that decision-makers consider information from various disciplines as the necessary knowledge is held by experts from different spheres. Traditional decision-making processes provide independent advice from experts of each field, but opinions may be difficult to put in perspective together, or even conflicting. Yet, decision-makers rely on their capacity to realize this confrontation. In order to ease and improve this aspect of the decision-making process, boundary organizations have been designed to manage the meeting of distinct areas of expertise and to encourage the production of knowledge through their confrontation. By initiating and framing debates between experts, they provide decision-makers with a panel of opinions that integrate the interactions between the various dimensions of the issue. The hypothesis is that this eased and increased interaction facilitates the emergence of dominant opinions. Though never formally proved, it is widely accepted based on the observation of existing boundary organizations. Through a multi-agent simulation, we can assess the impact of a boundary organization on the diffusion of opinions among experts of similar and different fields, both quantitatively (the number of dominant opinions and of experts who agree to each) and temporally (the time necessary to observe dominant opinions).

Scientific knowledge is essential to a sound decision-making process, but science is more than a simple reservoir of knowledge, competencies and people: it includes normative concepts such as objectivity, honesty, neutrality and truth that give it a privileged status (Guston et al., 2000). Yet the vision of a neutral science without influence is an illusion: scientific activities are conditioned by human values and intertwined with the main political, social and economic issues. Science must take into account the values of the society in which it takes place, and acknowledge its responsibility

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toward the society. The use of scientific knowledge in the elaboration of public policy results usually in hybrid entities, mixing facts and values, knowledge and identity, nature and culture, science and politics in institutions and social networks. Organizations should manipulate information legitimately and objectively without ignoring the subjectivity of science. Science includes in reality sciences, as it covers not only different areas of expertise, but also different approaches such as natural and social sciences. Decision-makers must include all the aspects of science involved in the debate while preserving its integrity: this leads to deconstruction and public controversy which may weaken science yet reveal tacit assumptions and hidden values of science, increasing the transparency of the process and avoiding further controversy (Guston et al., 2000). It should therefore be encouraged and managed to avoid impacting the credibility of science while using efficiently its knowledge: boundary organizations ensure that science brings in pertinent and useful information while maintaining its independence. This implies the ability to cross the boundaries between different areas and types of sciences.

The concept of boundary has been formalized by sciences in order to strengthen their differences with pseudo-sciences and scientific impostures. Boundaries were created to protect organizations from the outside and to maintain an internal order, as well as to impose the organization as a major actor (Davenport & Leitch, 2005). They allowed members to affirm their authority as experts over a field challenged by others, to maintain a monopoly by excluding others, and to enforce their cohesion while protecting their autonomy in front of pressures for control. A boundary is not a simple demarcation line that sets an established limit between two different areas of authority, but an intermediary zone of variable size, permanently challenged. It sets at the same time an area of permission and of restriction. While it plays its role to protect an organization from the outside, it also sets a barrier that limits or prevents flows of information with the outside. When two fields, under the authority of different experts, are involved and brought to interact over an issue, they naturally reinforce their boundaries, in order to avoid confusion and to clarify the responsibility of each. This reinforcement of the boundaries results in a lack of communication between experts of different aspects. Boundary organizations have been designed to manage the meeting of distinct areas of expertise and to encourage the production of knowledge through communication.

Boundary organizations are institutions that cross the gap between different fields of expertise: they are able to act beyond the boundaries while remaining accountable to each side (Guston, 2001). They encourage and manage a blurring of the boundaries to provide a better knowledge and understanding of a situation characterized by uncertainty. By promoting a flow of useful information, they permit an exchange to take place, while maintaining the authority of experts (Cash et al., 2003; Clark et al., 2002). They integrate the demarcation to allow for communication instead of division, leading to cooperation around common interests (Davenport & Leitch, 2005).

Boundary organizations have been created to allow for the internalization of debates between scientists, while keeping an image of a pure and unified science. They have evolved to handle the relationships between science and political power, where they have proved their interest. Miller defines them as "organizations that sit in the territory between science and politics, serving as a bridge or an interface between scientific research, political decision and public action" (Miller, 2000), and Guston as "institutions that internalize the provisional and ambiguous character of the apparent boundary between science and politics" (Guston, 2000). A boundary organization allows for science to take part in a societal debate while preserving its integrity and independence (Davenport & Leitch, 2005): its participation is managed to avoid impacting its credibility while ensuring an efficient use of its knowledge. Jasanoff showed that a blurry boundary between science and politics, rather than the clear and intentional demarcation traditionally applied, could increase the productivity of the

decision making process (Jasanoff, 1990). Boundary organizations may be applied to numerous cases of boundaries: between science and non-science, good science and bad science, as initially done, between science and politics, as currently done, but also between different fields or types of sciences such as natural and social sciences as modern environmental issues may benefit from.

Boundary organizations are similar to an interface between two dimensions, established and influenced by both sides, but independent. It allows for each side to express its reactions to the other's expectations, avoiding the traditional one-way flow or lack of communication. This capacity is unique to the boundary organization and this role could not be held by individuals of either side (Davenport & Leitch, 2005). To ensure the participation of actors from two socially different worlds, it is critical for boundary organizations to cross the functional and cultural boundaries. They in fact apply the principal-agent principle which defines organizational relations as delegations of authority toward agents by a principal who does not have the necessary information and/or competencies (Atkinson-Grosjean, 2007). Efficient boundary organizations are those that can answer to two different principals, while remaining stable despite external pressures and an internal instability of the boundary. Boundary organizations appear to face a reductive double set of constraints, but the different groups of experts, seen as distinct social organizations, are more similar than it seems, at least in their structure and behavior. In addition, the wider the zone between the respective boundaries, the greater the autonomy and the capacity for innovation (Miller, 2000). The double responsibility makes boundary organizations stronger, giving them a unique support that guarantees their impartiality (Guston et al., 2000): this dependence of boundary organizations on each side is as important as their independence (Guston, 2001). Boundary organizations are not fighting against a strong solid demarcation, but helping to stabilize or even create the boundary. They do not limit themselves to the zone between two areas, but extend inside each side, widening the boundary zone to internalize the possible areas of ambiguity and to handle on-going fluctuations. The boundary is permanently defined, criticized, challenged, defended and adjusted. The goal is to involve both sides in the construction of a boundary favorable to each perspective, while setting the limits to potential intrusions of one sphere into the other: the boundary organization must encourage interactions by increasing the permeability of the separation, while guaranteeing the integrity of each side by limiting the porosity (Socci, 2001). The blurring of the boundary is beneficial, but no one can actually determine the optimal level, and especially what may be more destructive than constructive (Guston et al., 2000).

Boundary organizations are not a new concept, but modern successful applications, such as the Health Effects Institute, the Office of Technological Assessment, the Agricultural Extension or the International Research Institute for Climate Prediction, demonstrate the diversity and interest of such institutions (Guston et al., 2000). Boundary organizations result in a structure able to integrate information from two different dimensions into one single analysis. Decision-making with respect to technological choices that enhance the well-being of society by modifying the man-environment relationship, associated with risk and uncertainty, requires considering norms and practices from natural sciences and economics. Boundary organizations appear as an interesting solution to integrate the different aspects of environmental issues, and it has been suggested as a possible evolution of existing organizations, such as the European Environment Agency (Scott, 2000).

The hypothesis that supports the existence of boundary organizations is that the resulting eased and increased interaction facilitates the attainment of dominant opinions among experts of different fields. Though never formally proved, this is accepted based on the observation of existing boundary organizations (Guston et al., 2000). Through a multi-agent simulation, we can assess the impact of a boundary organization on the diffusion of opinions and final positioning of experts of different fields, both quantitatively and temporally. The methodology is based on simulations where

agents positioned on a continuous model of opinion over two dimensions interact and modify their positions through series of one-to-one discussions; once the system is stabilized, we observe the number of opinions expressed, the ratio of experts agreeing to each opinion and the number of exchanges necessary to reach this distribution. A boundary organization of increasing importance is simulated to see the impact on those three indicators.

The model relies on a Multi-Agent System (MAS), a computer simulation where autonomous heterogeneous agents interact with their environment and with each other. MAS allow us to observe an emerging recurrent macroscopic behavior resulting from microscopic interactions that could not be deduced by simply aggregating the properties of the agents (Axelrod & Tesfatsion, 2006). Our model uses no desire or motivational component for agents, but a belief that evolves through time with respect to an interaction function between the entity and other agents. Those reactive agents have no representational function of their environment and show a reflex behavior with respect to one-to-one encounters. The model is based on previous work done on a model of continuous opinion dynamics (Deffuant & al., 2001) extended over two dimensions of opinion, representing two independent fields of expertise. Agents interact through one-to-one exchanges at each time unit and modify their position as a result. Agents are differentiated by credibility and uncertainty. The credibility of an agent represents how much other agents may be influenced by this agent, with respect to their own credibility. The uncertainty reflects the maximum distance between the position of an agent and that of his interlocutor. It is also used to influence the change of opinion of interlocutors, based on the uncertainty of each agent over the total uncertainty. The more interactions an agent has, the smaller his uncertainty becomes, hence the stabilization of the system. Due to the heterogeneity of agents, the change of positions is not reciprocal. Two kinds of agents (scientists and economists) are left free to interact in their respective field represented by two different axes. The boundary organization is introduced through agents called borgs: open to trans-disciplinary discussion, they are able to cross the boundary between the two axes, opening possibilities of exchange on both dimensions, while other agents remain limited to interactions within their field of expertise. Borgs are regular agents who gain a new property, no matter what their initial position is, mainstream or minor, extreme or average.

The simulation involves 200 agents equally spread over two fields of expertise and is left running over 1000 time units. The ratio of borgs is increased from 0 to 50%, by steps of 1% up to 10% and of 5% beyond 10%, with ten simulations at each value. Results are analyzed in terms of the number of opinions expressed once the positions are stabilized, the ratio of experts agreeing to each, and the number of time units necessary to observe 50% of the stable figures.

The impact on the number of opinions gathering each more than 1% of all agents is significant: 5% of borgs reduce it by 11%, 10% by 22% and 30% lead to a decrease of 32% of the final number of opinions, with no variation beyond this level. Opinions representing at least 5% are only slightly positively affected and require a minimum level to show a significant impact (increase of 3% with 10% of borgs, but of 30% with 20%, and no variation beyond). Opinions supported by at least 10% of agents are significantly increased, even with low ratios of borgs: they are increased by 19% with only 5% of borgs, and by 24% with 10%, to reach a maximum of 33% with 50%. The impact of a boundary organization is not linear, with the stabilization of the impact at a certain level, and a threshold effect in some cases. At low realistic levels of agents involved in the boundary organization, the impact is significant and immediate on the reduction of total opinions expressed and on the increase of opinions gathering the largest shares of experts, while average opinions are not significantly affected: the global reduction of the diversity of final opinions expressed is confirmed by an apparent transfer from minor to dominant opinions.

The impact on the concentration of agents around each final opinion is quite similar: 5% of borgs are sufficient to increase the number of agents agreeing to the dominant opinion by 19% to reach a maximum of 25% increase with 50% borgs. If we consider the sum of agents agreeing to the two main opinions, the increase is reduced to 17% at 5% but reaches 23% at 10%, for a maximum of 43%. A similar situation is observed for the five main opinions with an increase of 20% at 5% and a maximum of 41%. The sum of the ten main opinions increases by 15% with 5% borgs, by 20% for 10%, and by 35% for 20% to reach a maximum of 45% at 50%. The correlation factor of the variation of the dominant opinion is 80% for a boundary organization going from 0 to 10%, and between 87 and 93% for the six to ten dominant opinions from 0 to 50%. An other indicator is that without a boundary organization, it requires the 7 dominant opinions to gather 50% of the experts, when it requires 6 with 1% of borgs, 5 with 3%, 4 with 5% and only 3 with 15%. The concentration of agents around final opinions is significantly impacted by the existence of a boundary organization, even at low levels, with a stabilization of the impact at a certain level.

When considering the impact of a boundary organization on the time necessary to reveal dominant opinions, through the number of interactions necessary to reach 50% of the final situation, we can conclude that there is no significant impact. The correlation factor is below 40%, and the maximum impact does not exceed 10% in most extreme cases. This observation could reinforce the idea that the boundary organization does not influence the results of the debates.

We see that the rising interest for boundary organizations supported by successful cases is confirmed by virtual simulations. They reveal that boundary organizations do not require the involvement of a large share of experts to show a significant impact on the reduction of the diversity of opinions expressed and on the increase of the concentration of experts around dominant opinions, making it easier for the decision-maker to consider together the different aspects of an issue. Nevertheless, we cannot expect from a boundary organization to reduce the time necessary for experts to reach their final opinion. Boundary organizations seem to be able to increase the scale of confrontation between groups of opinion: they do not emerge as opinion leaders, but encourage the exchanges between experts by easing and increasing the transfer of information from one sphere to the other, which results in more affirmed positions of experts over the different dimensions of an issue.

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COMPETITIVENESS OF WINE EXPORT FROM THE REPUBLIC OF SERBIA

Branislav Vlahović[1], Anton Puškarić[2], Branka Maksimović[3]

Abstract

The authors of this paper analyze export and competitiveness of wine export from the Republic of Serbia. Main goal of the research reflects in perceiving basic features of export and competitiveness of wine export from the Republic of Serbia on international market. The analysis encloses time period 2004-2007.

The amount of wine export is very modest and, in observed period, was realized average export of 8,6 million litres, which value amounts 9,6 million USD. Only 5% of total domestic production is exported. In export structure dominate CEFTA agreement signatory countries.

Export price of wine from Serbia is doubly less in regard to average world price, and thrice in regard to the biggest world exporter – Italy. Average export price of wine produced in Serbia is on the level of 1,11 USD per litre. The export structure is very unfavourable, i.e. dominates wine in bulk (90%), while only 10% of total export makes wine in bottles, which, for sure, reflects to attained export price.

The authors quote that main limitation factors of Serbian wine export are small surfaces under grapevine, inappropriate structure of production, i.e. lack of qualitative and top-class (famous) wines. The wines which produce in Serbia, on international market, are competitive by price. However, low quality represents limitation factor of competitiveness increase. Unfavourable production structure and wine export represents one more limitation factor of competitiveness increase. In total wine production in Serbia, top-class wines participate with less than 15%, participation of qualitative wines is 20%, while the higher participation, more than 65%, have table wines, and more produces white (64%) than rose wines (36%). Previously mentioned is in opposition with demand trends on international market. Along with quality increase and change of production and export structure, there can be expected also increase of Serbian wine prices on international market.

Analyzing the world turnover of wine, the authors resolve that leading exporters of wine have developed production and long tradition in wine export. Besides, there are series of governmental stimulations, aiming at export increase, which is significant from aspect of competitiveness increase.

The European Union has increased wine export quota from 55 to 63 thousand hectolitres to the Republic of Serbia for duty free export, and mentioned decision on export quotas increase represents an incentive for faster development of viticulture and wine production in Serbia.

As an imperative, the authors quote increase of high-quality wines participation in export,

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which have higher price in regard to table wines. They find that own chance for export must not be looked-for in quantity, because Serbia is relatively small wine producer, concerning high quality according to selected market segments, but also that Serbia must leave the path of industrial wines and produces only high-quality wines. In this paper has been pointed out to necessary measures, aiming at more dynamic export and competitiveness increase of wine export from Serbia.

The Authors find that main focus should be on intellectual capital, which means permanent education of producers, in order to get wines of the highest quality which will find their consumers in a competitive world market.

Key words: wine, export, competitveness

1. Introduction

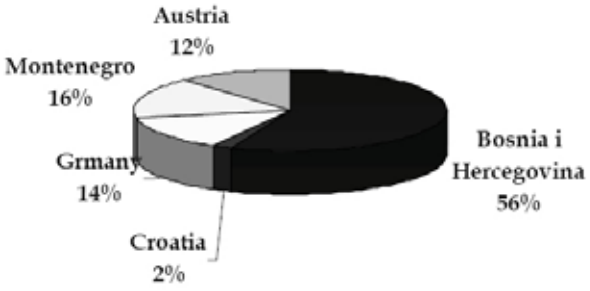
Each country tends to increase its own export and insure high competitiveness level on international market. The competitiveness depends on economic entities' capability to export own products, along with parallel efficient use of all resources, in order to satisfy consumers' needs. Main goal of the research is to perceive basic characteristics of export and wine export competitiveness from the Republic of Serbia on international market. Basic resources and data were taken over from statistical base of the Republic Institution for Statistics, for time period 2004-2007. There has been used FAO and USDA data. The research bases on, so called, „desk research"and represents processing of available data, along with appliance of standard statistical-mathematical methods.

2. Research results

2.1. Wine export from the Republic of Serbia

The Republic of Serbia has realized average wine export of 8,6 million litres in period 2004-2007, which had amounted 9,6 million USD. Only 5% of total domestic production is exported. The most important foreign-trade partner is Bosnia and Herzegovina, where realizes in average 4,8 million litres, some more than a half (56%) of total wine export. With this country there is an agreement on free trade, which applies since 2002, while complete liberalization has been in effect since 2004, with exception that BH, since than till nowadays, has introduced one-sided, many times, various limits on import from Serbia. Montenegro comes after with 16%. Some less significant buyers are Germany, Austria and Croatia (picture 1). Those countries have absorbed almost entire wine export from Serbia.

Picture 1 - Structure of wine export from the Republic of Serbia(2004-2007)



It is evident that, in export structure, prevail CEFTA Agreement signatory countries. CEFTA 2006 in transitional period, which will last the farthest till 2010, holds trade liberalization level achieved in accordance with individual agreements on free trade. Numerous factors affected to realize wine export from Serbia, such as:

- Volume and structure of domestic wine production. Average wine production in the Republic of Serbia, in observed period, was amounted 178 million litres,
- Level of demand, i.e. wine consumption in the country. Total wine consumption per capita is 16 litres (2006), which means that total needs of domestic market amount around 120 million litres,
- Relation between prices on domestic and international market,
- Agrarian policy measures, first of all, height of government incentives for export-oriented production and similar.

Main limitation factors for bigger export are small surfaces under grapevine, inappropriate production structure, i.e. lack of qualitative and top-class (famous) wines. In the structure of domestic wines dominate table wines, with 65%, than follow qualitative with 20%, while top-class wines participate with just 15% (*www.poslovni magazin*).

France represents the biggest world wine producer , with 18% of world and almost one third of EU wine production. The wines produce in several wine regions, the most famous are *Bordeaux, Burgondy* i *Shampange*. The grape grows on around 800 thousand ha of vineyard and here produces around 7-8 milliard bottles of wine (*www.vinismo.com*).

International wine market is very fed up, so there is not at all easy task to export wine. Value of wine turnover on international market amounts 22 milliard of USD annually (2007). The most important wine exporter is Italy, with 1,8 million tons, which is one fourth of world export and earns about four milliard USD (FAO, 2007). It represents also a second world wine producer (behind France). Major part of export it places on USA market. Major part of wine export is in class between table wines and wines with controlled geographic origin. The most famous export commercial red wines are: „*Chianti Classico"*, „*Barolo"*, „*Brunello di Montalciano"*.Among white wines dominate *"Fiano di Avallino"* and *"Greco di Tufo"* , which origin from region *Alto Adige*, i.e. *Campanie* (*www.vinismo.com, 2008*.).Toscana is famous after production of rose wines, however, significant places in export take also white wines, like "*Gavi", "Arneis"* and *"Vernaccio di San Gimignano"*. Than follows France, Spain, Australia, Chile. Those countries produce almost three fourth of total world wine export. They have high production and long tradition in wine export. Besides, there are numerous government incentives in order to increase export.

The biggest wine importer in the world is Germany, which imports 1,3 million tons, or 17% of total world import (2007). The import is a result of relatively high demand on the market. Goal is also to supplement assortment with various qualitative kinds of wine. It is characterised by often wine re-export, which buys in bulk, mix with various sorts and export in bottles. The biggest world importers are Great Britain, USA, France and Russia. Together they absorb more than half of total world wine import.

EU is the biggest world producer, consumer, exporter and importer of wines. In last years, it had lost a part of its traditional markets for wine export, because of competitive cheaper wines from Australia, Chile, New Zealand and United States, and also marks drastically increase of import.

2.2. Competitiveness of wine export from the Republic of Serbia

Export price of wine from the Republic of Serbia is on the level of 1, 1, USD per litre (table 1). It depends on kind of wine (table, qualitative with protected geographic origin, top-class wine etc.) and export method (in bottles or goods in bulk). Export structure is very unfavourable, i.e. prevail wine in bulk (90%), while just 10% of total export does wine in bottles. This definitely reflects to attained export price. The highest price achieves wines which export in Croatia and the lowest which export in Austria.

Table 1 - Export price of wine from the Republic of Serbia to countries-the most important buyers(2004-2007)

Country	***Export price, $ per litre***
• *Croatia*	1,78
• *Montenegro*	1,44
• *Bosnia and Herzegovina*	1,27
• *Germany*	0,56
• *Austria*	0,49
Average	***1,11***
Source: account based on Foreign Trade Statistics, Belgrade	

It is indicative that export price of wine from Serbia is significantly lower than realized world average price, which amounts 2,60 USD per liter. EU export price amounts 2,8 USD per liter. Italy, as biggest world exporter, realizes export price of 3,36 USD per liter. As for more famous wines, their price depends also on certain year of production quality. The price is also caused by economic situation, and by quantity of current reserves.

It is necessary to utilize physical and financial capital to its maximum, and special attention should be given to intellectual capital. Since physical and financial capitals are significantly limited in the agriculture of Serbia, we find that focus should be at intellectual capital. This means permanent education of producers and exporters, in order to get the wines of highest possible quality.

Knowledge should be a dominant factor of development in this area of production and export. At the same time, this represents the essence of Lisboan agenda. According to this agenda, EU should by 2010 focus at economy based on knowledge, in order to retain the advantage, comparing to the world's most developed countries.

Evidently, the Republic of Serbia is price competitive on international market, but than a question of quality is put. Along with quality increase and change of production structure and export, there can be expected also increase of Serbian wine price on international market. Namely, in total wine production in Serbia, top-class wines participate with less than 15%, participation of qualitative wines is 20%, while the highest participation, more than 65%, have table wines. It is opposite to demand on international market.

Change in the structure of domestic production towards needs and demands of international market, is necessary. This means change in the assortment, as well as constant improvement of production techniques and technology. In order to achieve this, it is necessary to apply modern trends related to production, packaging, distribution and promotion of wine. Constant and permanent education of wine producers is a necessary condition for improvement of wine quality and export from Serbia.

White wines are ahead (64%) of rose wines (36%) (*www.poljoprivreda.info)*. In the world, at the moment, is bigger demand for rose wines, while in our offer dominate white wines. For example, in total structure of wine production in France dominate rose wines with participation of 73%, while white wines participate with 27% (*Ribero-Gajon, www.ambafrance.srb*).

Increase of Serbian wines competitiveness on international market is possible to base on following activities:

- Improve quality according to standard of signatory countries – to certify system of safety and quality, first of all, EUREGAP and HACCP standards.
- It is necessary to direct producers to production of qualitative wine sorts of grapevine, in order to get qualitative wine.
- To respect tradition, along with modern production technology appliance. In order to get as better as possible wine features, there must be taken care on production technology.
- To obey strict hygienic requirements in production.
- To reduce production costs in order to get more favorable prices on international market.
- Highest export incentives by the Ministry for Agriculture. The amount of incentives for 2009 for wine is 5%. Right to use these assets do not have exporters who export goods of domestic origin on territories of Free Trade Agreement signatory countries in Central Europe (CEFTA 2006), as well as export of qualitative sparkling wines and wines of fresh grape on EU market within preferential quotas. There can be concluded that export incentives for wine are very modest and do not represent more significant stimulus of export.

Among mentioned, in order to increase surfaces under vineyards, improve quality and strengthen competitiveness of Serbian wine, it is necessary also next (*Ekonomist*, 2007):

- Bringing Law on wine, which must be adjusted to EU regulation,
- Faster and more significant increase of surfaces under vineyards before accessing the EU, because of possibility to use incentives from EU (it is possible to use by financial support for newly planted areas raising, adoption and construction of wine-cellars, equipment purchase etc.),
- Setting up Viticulture (cadastre) and Wine Register,
- Intensive support to marketing, wine promotion, design of package, export of Serbian wines to new markets, affirmation of autochthonous grape sorts,
- Production increase of wines with controlled geographic origin,
- Setting up the system of laboratories for wine analysis in accordance to EU standards and protocols and O.I.V.,
- Setting up scheme of grapevine seedlings production certification. EU and Serbia obliged themselves, by Protocol on Wine, to respect mutually geographic origin marks and traditional names of wine and other alcoholic beverages.

Hence certain conclusion aroses, that the imperative is export increase, first of all, of high-qualitative wines, with much higher price in regard to table wines. We think that real chance for export is not in quantity, because we are relatively small wine producers, but in high quality according to selected market segments. Serbia should leave the path of industrial wines and produce only high-quality wines. There should try specialization of production on less series of high quality (e.g. wine *„Bermet*“ etc.).

3. Conclusions

- Average wine export from the Republic of Serbia is 8,6 million litres, which amounts 9,6 million USD.
- Major part of wine export from the Republic of Serbia is directed to Bosnia and Herzegovina (56%), than Montenegro, Austria, Germany and Croatia.
- Export price of wine from the Republic of Serbia is doubly less in relation to world price.
- To direct to production of qualitative, first of all, red wines, with protected geographic origin
- It is necessary to raise competitiveness of wines from our country in regard to other most significant world exporters.
- The competitiveness can be raised by constant changes in productive and market orientation toward needs and requirements of concrete market segment. This means change in the assortment, as well as constant improvement of production techniques and technology.
- Chance to export must not be looked in quantity, but in high quality according to defined market segments. There should try specialization of production on less series of high quality (e.g. wine *„Bermet*“, etc.).
- Physical and financial capitals are significantly limited in the agriculture of Serbia, we find that focus should be at intellectual capital.
- Constant and permanent education of wine producers is a necessary condition for improvement of wine quality and export from Serbia. Intellectual capital should grow into activator of development in this area.

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Parallel Workshop Session D

INVESTMENT IN HUMAN CAPITAL, EXTENSION AND AGRICULTURAL R&D

FROM THE CONCEPT OF MULTIFUNCTIONAL AGRICULTURE TO THE MEASURE OF MULTIFUNCTIONAL FARMING

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Abstract

The objective of this paper is to deeply analyze some of the theoretical and methodological implications linked to the definition, the characterization, the evaluation and the estimation of the economic results of a multifunction agricultural farm. A deep study of these aspects seems essential for two reasons. On one hand, society is pressing farms to enlarge the existing set of goods and services; on the other hand, sector policies offer to farms new opportunities, which regard the allocation of services linked to the different functions that agriculture is able to carry out. In these conditions, in order to make the entrepreneur able to decide which services to set in motion, considering the economical input that their activation could bring to the farm, it is fundamental to identify an analytic method that is capable to estimate and evaluate the economic results of a multifunction farm.

Key words: multifunctionality, economic indicators, rural development

Introduction

The vast literature on multifunctionality in agriculture has focused so far, other than on the definition of the concept, especially on the description of the single functions, on the role which such functions can play in the development of a rural territory and on how politics, both agricultural and of rural development, can support the subjects through which such multifunctionality is expressed.[4]

Existing literature tends to define multifunctionality as directly, although not exclusively, linked to the different functions agricultural land fulfil (Jongeneel, et al, 2008), so that the unfolding of multifunctionality reflects the fact that nowadays agriculture is expected to support the development of rural areas through functions other that primary ones only (Labarthe, 2009). But despite a growing consensus among both scholars and policy makers around the need of recognizing and valuing a wide range of farm production outputs "multifunctional agriculture" is by no means clearly and uniformly conceptualized or understood (Wilson, 2007).

Less attention has been paid to the analysis of a multifunctional farm, to its theoretical framework, to the identification of different typologies, to the identification of the methods to use for a correct evaluation and interpretation of the management results and, key aspect, to the definition of criteria to measure a farm's level of multifunctionality.

The objective of this work is going more in depth with reference to some of the methodological implications linked to the definition, evaluation and interpretation of a multifunctional farm results.

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4 For the definition of multifunctionalty and a view of the main works on this topic see OECD, 2001 e Van Huylenbroeck, et al, 2007.

The availability of such tools represents the preliminary requirement in order to define farm multifunctionality indicators based on the incidence that the linked activities have on its total economic results. Such indicators, besides improving the evaluation and interpretation of management results, can be seen as operative tools in order to analyse the impact of the sector policies at a microeconomic level.

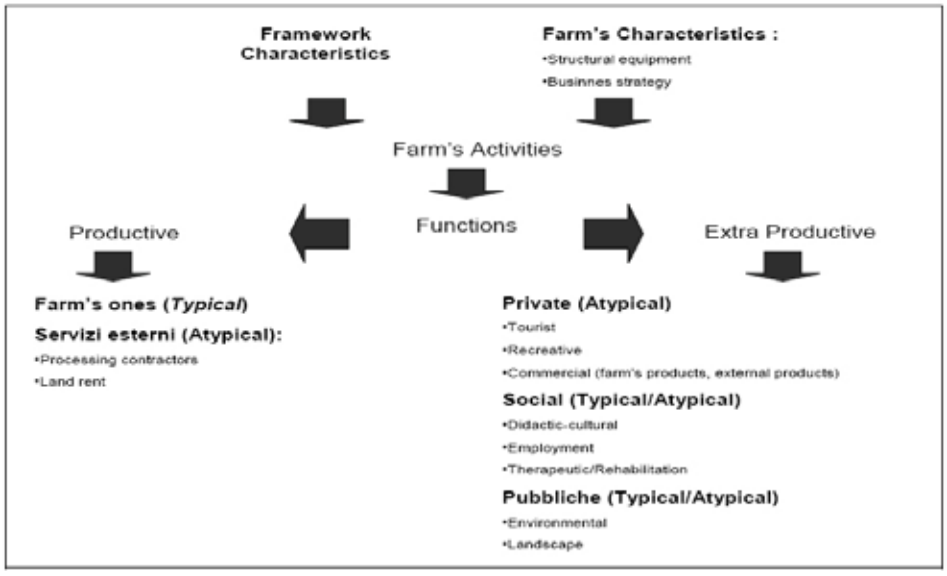
In this paper, after having drawn a classification of the extra-productive functions which can be carried out in the farm, a scheme is suggested in order to highlight the economic dimension of such functions in the frame of management results, and in order to measure, on the basis of the dimension reached by the activities linked to the single extra-productive functions, the farm multifunctionality. In the last part, in order to clarify the suggested methodology, a case study is showed. This case study makes reference to a farm where the extra-production activities have a remarkable importance and in which the different multifunctionality indicators which have been suggested will be evaluated.

A Profit and Loss Account proposal for a multifunctional farm

The turning of agriculture into multifunctionality can be summarised in two different dynamics: a process of *deepening* of the agricultural dimension and a process of *broadening* of the activated functions (Van der Ploeg, 2003). The first remains implicit and influences the agricultural activities by binding the productive processes; whereas the second one allows enhancing the synergic effect between ordinary and extra-ordinary in the agricultural sector in terms of economic results. In this situation, it seems necessary to distinguish with clarity between these two components within farms, with reference both to the activities carried out and the contribution to economic results.

In order to get to the definition of an operative model through which the role of multifunctional components can be highlighted among the farm economic results, it is useful to make reference to the scheme in figure 1. It highlights how the ensemble of the activities carried out in the farm, determined by the context and its structural and entrepreneurial characteristics can fall within two function macro-typologies: productive and extra-productive.

Figure 1 – Scheme of the multifunctional farm



Among the productive functions are all the cultivation, breeding and transformation activities which uses farm productive factors and which give origin to agricultural products, as well as the coupled payments. If such activities are carried out inside the farm itself, they are to be numbered among the farm "typical" activity[5] (since it is "typical" for a farm to carry out agricultural productive processes). On the contrary, when capital and work are at other farms' disposal, the resulting services (such as rental of farm land or works on behalf of a third party) fall within the "atypical" farm management.

When the farm productive factors are employed for activities linked to extra-productive functions, that is to say which do not aim to produce agricultural goods, they are always in the context of "atypical" management. The discriminate principle for the classification of extra-productive services can be the type of function they fall within and the level of remuneration they get on the market (Van Huylenbroeck, et al, 2007). It is therefore possible to distinguish (Franco, 2005):

- *Private services*, which fall within the functions of tourist, recreational and commercial type and which are offered on the market.
- *Public services*, which fall within the landscape and environmental functions and which produce benefits for the community. It has to be clarified that, in the approach adopted, only the services generating positive externality are included; whereas all forms of reduction of negative externality produced by the agricultural activity fall within the productive function.
- *Social services*, which fall within the didactic, cultural and therapeutic-rehabilitative function and which supply services intended partially for the market, partially for the community, since they determine an impact on the whole society, contributing to the cultural growth and to the civil improvement of its members.

Starting from the division of the activities according to the suggested logic, it is possible to get to the definition of a profit and loss account scheme in which revenues and costs for each single component are highlighted. This makes it possible to determine in an analytic way the entity and the relative weight of single productive and extra-productive functions, and, consequently, how much multifunctionality weighs upon farm incomes.

A loss and profit account scheme which adapts to the evaluation of multifunctional farm results is offered in figure 2.

The section referring to the typical management describes the result of the agricultural productive activity to which the extra-productive component represented by the potential single farm payment provided by the CAP on historical bases has to be added. Indeed, if we take as reference the definitions of "Agricultural Activity" expressed in the Reg. 1782/03 and confirmed by art. 2 of Reg. 73/2009, and of "Conditionality", present in art. 5 and 6 of the aforementioned regulation, it can be inferred that the agricultural activity, even where it is not explicitly aimed to the production of goods, is tied to land care (EC, 2003; EC, 2009). The fact that maintaining good agricultural and environmental conditions (GAEC) and the respect of the statutory management requirements (SMR) is a foundation of agricultural activity entails that the single payment received by the farms holding CAP entitlements, even if calculated on historical bases, results inseparable from such an activity and therefore has to be introduced among the revenue components of the typical management.

5 For typical activity is meant what already called in other studies "farming", while for atypical activity is meant what in the same studies is defined as "non farming". Without entering in a discussion about terminology, the definitions used in this paper seems more appropriated to the classification utilized along the study.

Figure 2 - Loss and Profit account scheme for a multifunctional farm

A. Typical management
A.1 Productive component
A.1.a Revenues
- Value of products
- Payments linked to production
A.1.b Costs
- Production variable costs
- Production fixed cost
A.2 Extra-productive component
A.2.a Revenues
- CAP Payments
A.2.b Costs
- CAP Application
B. Atypical management
B.1 Productive component
B.1.a Revenues
- External agricultural services
- Rental of farm land
B.1.b Costs
- Machinery and Labour costs
B.2 Financial component
B.2.a/b Active/passive interests
B.3 Extra-productive (multifunctional) component
B.3.1 Private services
B.3.1.a/b Revenues and Costs
- Tourist services
- Recreational services
- Commercial services
B.3.2 Social services
B.3.2.a/b Revenues and Costs
- Cultural services
- Didactic services
- Therapeutic services
B.3.3 Public services
B.3.3.a/b Revenues/Costs
- Environmental services
- Landscape services

In the extra-characteristic part, the items referring to the supply of productive services are present as well as the ensemble of revenue and cost components linked to the multifunctional extra-productive activities, divided in the three typologies described.

As it has been hinted at, the environmental contributions (good agricultural practice, integrated pest management, organic farming) are not to be introduced in these typologies, as well as the relative costs, because they do not fall within an atypical environmental service, but rather within a particular modality of carrying out the agricultural productive process. On the basis of this consideration, the possible costs for environmental certification have to be divided in two parts: one relative to the certification of the productive process (and therefore typical of the characteristic

activity), and another linked to the possibility of commercialization with a communitarian brand, which represents a cost of private extra-productive services linked to the sale of products.

Another aspect involves the possible premium price obtainable in the commercialization of certified products; it configures itself as the revenue of a service intended for the market and linked to the commercial ability of the entrepreneur and, therefore, falls within the atypical management. Similarly, also the premium price obtainable through direct sale falls within private services.

Among the activities connected to private services, the incomes deriving from the hosting activity (farm holiday and restaurant) have to be included. They are determined by the difference between revenues and costs, included those linked to the possible depreciation charges for investments, after tax (in case of public aid obtained in order to realize them). A similar treatment has to be given to the activities linked to social services, and therefore the revenues and costs generated by didactic, cultural and therapeutic-rehabilitative activities carried out in the farm.

The interventions aimed to generating positive externality concerning the environment and territory safeguard are to be considered as services connected to the environmental function and should be evaluated by considering the investment costs and the relative public aid.

Lastly, a further section relative to financial management needs to be introduced in the scheme. It falls within the atypical extra-productive components but, obviously, it has to be distinguished from multifunctional activities.

Multifunctionality indicators

On the basis of the suggested loss and profit account, it is possible to identify a farm "multifunctionality gradient", given by the combination and intensity with which the different agriculture functions are linked (Wilson, 2007). Indeed, by comparing the results of different "managements", it is possible to calculate some indexes that highlight the economic contribution of multifunctional activities carried out in the farm, both in their ensemble and for single service typology (public, private and social).

These indexes, depending on their referring to incomes, revenues or costs, lead to the evaluation of the farm "multifuncionality gradient" from different points of view. If we make reference to revenues, the "commercial" value of the different extra-productive activities is emphasized; if the parameter of reference is income, the aim will be to estimate the contribution that such activities have brought to the total result: if, finally, costs are taken into consideration, the attention is focused on the entity of the investment on multifunctionality by the farm.

A first index able to evaluate the multifunctionality level is represented by the incidence of multifunctional service incomes on the total of farm management expressed by net income. This index (MF/NI), however, does not appear completely satisfying as it takes into consideration also the financial results and the productive services offered on the market which do not represent activities linked to agriculture multifunctionality.

A better understanding of the weight of multifunctional activities is provided by the ratio between the value of extra-productive services (private, social and public) and typical management, as the expression of the agricultural activity carried out in the farm. Such ratio (MF/ TM), as indicated previously, can be calculated in terms of revenues (MF/TM R), incomes (MF/TM I) and costs (MF/TM C).

Making reference to the "multifunctionality index" based on the revenues, values next to zero identify "traditional" farms, in which the offer of multifunctional extra-productive services is low; values around one indicate a substantial balance between the farm's agricultural and multifunctional identity; values above one characterize farms where multifunctional services are predominant as compared to agricultural productive activities. In the latter case, there is a weakening of the functional link between primary activity and supply of services connected to agriculture, which can result in the distortion of the farm's agricultural identity itself, making it closer to a different type of "rural" firm, a service provider, farther and farther from the agricultural dimension and, consequently, less and less multifunctional (Arzeni et al., 2001).

An empirical case of multifunctional farm

In this paragraph, the results obtained by the application of the loss and profit account and the multifunctionality indexes, as they have been previously defined, to a farm of central Italy are shown.

Description of the farm

The considered farm, which covers an area of about 140 ha located half on a plain and half on hills, represents an interesting case study for the variety of the productive processes which are carried out and for the recent development of different multifunctional activities.

Part of the land (80 ha) is rented and the farming carried out on the other 60 ha includes three productive processes: wheat, vine and olive tree. The harvested wheat is sold wholesale, while the oil obtained from the olives, which are processed in an external oil mill, is commercialized in the farm's shop. On the contrary, the grape is given to a wine cooperative that produces the wine and bottles it; afterwards, the farm repurchases part of the bottles in order to commercialize them directly.

Therefore, a first multifunctional activity is direct sale; moreover, the farm's premises, recently remodelled, are rented for events and weddings. Both these activities, being oriented towards the market, fall within the private services of multifunctional activities. In recent years, a didactic activity has been developed: laboratories for children and nature sightseeing, which can then fall within the supply of social services. Finally, the farm has intended some land for the feeding of wild fauna , for which it benefits from aid as envisaged in the local plan for the safeguard of wildlife and biodiversity and provided in the framework of the agro-environmental measures of the "Piano di Sviluppo Rurale del Lazio" (Rural Development Plan for the region Latium). Such an activity, since it generates a positive externality, definitely falls within the agriculture's environmental function and it is considered a public service.

Economic results

The economic data are taken from the farm accounting with reference to the year 2008 and they have been processed and reclassified according to the loss and profit account scheme suggested in paragraph two.

Table 1 - Economic results of the farm in the case study

Component	Description	Value (€)
A.1 Productive	Value of products	157.978
	Payment for organic management	30.155
	A.1.a Revenues	188.133
	Production variable costs	105.738
	Production fixed cost	69.694
	A.1.b Costs	175.433
A.2 Extra-productive	A.2.a Revenues (CAP Payments)	12.600
	A.2.b Costs (CAP Application)	3.000
A. Result of Typical Management		**22.300**
B.1 Productive	Rental of farm land and buildings	
	B.1.a/b Revenues-Costs	24.334
B.2 Financial	B.2.a/b Active/passive interests	-2.850
B.3 Extra-productive		
B.3.1 Private services	Commercial services (direct selling)	
	Tourist services (weddings and events)	
	B.3.1.a Revenues	70.064
	B.3.1.b Costs	67.014
B.3.2 Social services	Cultural services (didactic farming)	
	B.3.2.a Revenues	20.645
	B.3.2.b Costs	19.281
B.3.3 Public services	Environmental services (biodiversity)	
	B.3.3.a Revenues	7.200
	B.3.3.b Costs	1.205
B. Result of Atypical Management		**31.894**
A+B. Net income		**54.194**

As far as the farm agricultural part is concerned, the revenues coming from the products commercialized directly in the farm have been determined making reference to the wholesale market price and not the one which is applied in the farm shop: as it has been said before, indeed, the *premium price* which can be obtained by direct sale is part of the commercial activity (extra-productive) and it is included in the specific section of the loss and profit account. In the same way, the products' organic certification costs fall within the private commercial extra-productive services. Active rentals, even if they are an atypical component of farm management, are not to be considered as multifunctional activities because they maintain a productive connotation; for this reason they should not influence the calculus of multifunctionality indicators.

From the data of the loss and profit account (table 1), it is clear that the typical management result, even if bearing the remarkable investments for the planting of new vineyards, is largely positive, generating an income of € 22,300.
On the other hand, the ensemble of public, private and social services provided in the framework of multifunctional activities generates an income of € 10,409; here as well the result is definitely penalized by the costs met for the modernization of the structures dedicated to multifunctional activities (part of which have been co-financed in the framework of the measures pertaining to the Rural Development Plan). This is the reason why environmental services represent the main income item (among the multifunctional activities) at present, even though they show definitely lower revenues as compared to private and social services.

Multifunctionality indicators

As suggested in the methodological part, a first indicator in order to evaluate the weight of multifunctional activities in the farm is represented by the ratio between the income derived from the related services (€ 10,409) and the net income (€ 54,194), which has a value equal to MF/TI=0.192 in the examined case, that is to say that almost 20% of the farm income originates from multifunctional activities.

More information can be deduced from the three indexes related to the ratio between the value of multifunctional services and the typical management result, expressed in terms of revenues, costs and incomes (table 2). The three indexes have very similar values and, altogether, allow us to state that from the economic point of view the multifunctional activity weighs upon the whole management in a remarkable way, even if maintaining an equilibrated ratio with the characteristic activity.

Table 2 - Value of the multifunctionality indicators

	Typical management	Multifunctional services	Index	Value
Revenues	200,733	97,909	MF/TM_R	0,488
Costs	178,433	87,500	MF/TM_C	0,490
Margin	22,300	10,409	MF/TM_I	0,467

The fact that the three values are set a little under the value of 0.5, that is to say that the agricultural component doubles the multifunctional component, puts the farm in a traditional path where activities are being progressively diversified in a multifunctional prospective. Thus, this is a case where different provided services do not represent an alternative to the use of farm facilities, but they allow, by means of a tight integration with the productive activities, to enhance them for tourist, cultural and environmental purposes.

Conclusions

The aim of this work was to define a scheme in order to classify the farm economic results which allows us to highlight the revenue and cost components of the single activities, with particular reference to the services linked to the various extra-productive farming functions.

Starting from this scheme, it is possible to calculate some descriptive indexes of the farm's "multifunctionality level". These indexes, in addition to their important contribution to the interpretation of management results through a targeted balance sheet analysis, represent a useful tool in order to evaluate the impacts of agricultural policies at the microeconomic level. Indeed, the analysis of the indexes' evolution allows verifying the spill over effects, in terms of sectors and territories, of the measures in support of economic diversification which are included in the second pillar of the CAP.

In the same way, knowing the multifunctionality level of farms which operate in a rural context can help improve the efficiency of the distribution of public financial resources. Indeed, if it is true that when the number of services provided rises, the farm becomes more and more multifunctional, it is also true that if the extra-productive services, in terms of income, revenues and costs, outnumber the typical activity, then the farm tends to progressively drift away from its agricultural identity. Thus it follows that a farm showing multifunctionality indexes with high values should be considered more as a rural firm providing services, rather than a multifunctional farm. In such cases, in the perspective

of efficiency we mentioned before, it seems reasonable to take into consideration the eventuality of downsizing, or even revoking, the aid that such enterprises/firms receive within the first pillar. Indeed, these firms appear to be mainly the recipient of the resources budgeted by the second pillar, since they contribute in a significant way to rural development with their marked predisposition towards services, even in all those cases in which the agricultural activities are relegated to a marginal role.

A key point in this logic of reallocation of the communitarian resources is obviously the choice of the most adequate multifunctionality indexes and of the values which can discriminate between "multifunctional farms" and "rural firms", a process that cannot leave aside the involvement of local decision-makers.

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SELECTION OF AGRICULTURAL LAND FOR MULTIFUNCTIONAL AGRICULTURE - QUANTITATIVE MODEL

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Abstract

The modern concept of rural development implies the use of agricultural resources, primarily agricultural land, for other (non-agricultural) activities besides its agricultural purpose. The integral aim of this concept of rural development is the maximization of economic results, besides the sustainable development of rural areas, environmental protection and the production of strategic (staple) agricultural products.

The objective of this paper is to define the general, theoretical, quantitative model for the determination of the size and quality of agricultural land which, considering the above-mentioned demands (criteria) is optimal for the utilization in agricultural production in certain regions. The remaining agricultural land would be available for the non-agricultural purposes.

The economic optimal model for the selection of agricultural land in the traditional agriculture is the model of linear programming. The criteria of the land selection for traditional agriculture are the economic effectiveness (measured by net income or by gross national product) and the economic efficiency (measured by the production economy). The maximum economic effectiveness is determined by the standard method of linear programming and the maximum economy by the method of broken linear programming. The solution of compromise can be determined by multi-criteria programming, based on the minimum differences.

The limitation groups in the mentioned variations of the model are: limitations of production quotas of agricultural products, minimum quantities of staple agricultural products, limitations of processing plants in a region (minimum and maximum), limitation of crop rotation, limitations of the needs in animal husbandry for bulky forage and limitations of agricultural land according to various types of utilization. By quantitative defining of the structure and size of agricultural land for traditional agriculture, "the surplus" and structure of agricultural land available for non-agricultural purposes is automatically determined.

Key words: agricultural land, optimization model, use for non-agricultural purpose

Introduction

One of the harmful it not even dangerous irrationalities of man's behaviour is that concerning his relation and attitude toward his environment. In economy, it is usually the short-term changes causing easily recognizible manifestations that attract professional attention most. In economy, it is usually the short-term changes causing easily recognizible manifestations that attract professional attention most. At the same time the slow, almost unnoticable changes are neglected though having some very dangerous and quite often irreversible effects. Such are the changes of the quality of

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soil, subterranean water there are various taxes for the use of artificial objects, anybody can use (according to his own criteria, paying no special tax) land, water and air as economic resources. These resources are available without payment; the costs of their maintenance most often are not causally related to their use and to profiting from them.

To put it figuratively, we behave like a man who carefully cures his unpleasant cough, but proceeds smoking and gives no attention to the slow, long-term changes in his body that can easily have cancerogenous consequences. Quite comparable is the way we treat land resources.

This paper is aimed at pointing to some of the consequences of the non-rational use of agricultural land. Several methodological problems are also discussed concerning the selection of agricultural land the use of which is economically unjustifiable in conditions of agricultural commodities production.

Land exploitation and food production: some general problems

Borojevic was undoubtedly right arguing that "Our major natural resource is land and we are still not conscious of the fact that there isn't much agricultural land and that each year we easily lose hundreds of hectares" (2).

In the history of mankind there were various examples of fertile soils destruction and the related disappearance of human civilizations. It would be enough to mention an alarming process in contemporary Africa: during the last 50 years some 650 000 square kilometers of potentially arable land in the south of Sahara has turned into deserts (4). Until recently, gigantic dams were considered a sort of sacred symbols of African progress. However, scientific research and measurements have contributed to the conclusion that these "super-dams" cause more damages than benefits. The Egyptian Asian has for ever taken away 400 000 ha of arable land. The as combo dam in Ghana caused the inundation of an area almost as large as Lebanon, with actually most fertile fields in valleys by the Volta. The change of this river's course has affected the Atlantic Ocean streams which consequently resulted in destruction of some 100 km of seashore. Besides, huge dams have also caused various social and economic problems, like disappearance of many villages, ruining of small producers, etc. (1).

Unfortunately, there is negative example in Middle Europe. Well-known is a problem of Bős-Nagymaros, with all consequences what already manifested.

Agricultural land has also been continually lost due to some other needs of the mankind. According to Madas (6), "World population is, at the present tempo of increase, doubled each 35 years. This increases the requirements for residential acreages, which are now 0.08 ha per inhabitant (including apartment, roads, long/distance power lines, water supply, etc.). The 3,2 billion hectares which, speaking theoretically, can be used will be reduced to more one billion by the year 2070 – which probably won't be enough to meet the needs for rood".

On the other hand, the nutrition problem has always generated an immense pressure on global political relations. Even in 1965 FAO began to monitor the international situation concerning agriculture and nourishment. Under the influence of FAO 's findings, in early 1970 's the prognostic activities were given rise to, so that quite a number of scenarios were lunched concerning possible movements in providing enough food for mankind. These scenarios were mostly of the Malthusian type, as it is the case with the papers of Meadows and his group, on the limits of growth (7), of Mesarovic, Heilbroner, Erlich, Forrester (9). Even the authors who did not approve of their concepts, like Hermann Kahn, several Soviet authors, the Bariloche group did admit the existence

of a final limit of growth on the Earth. This explosion of dark visions has probably contributed a lot to a (psychological) pressure toward appropriate measures on the global level. After the 1974 UN conference on food some major changes occurred resulting in a controversial situation on the global level. Famines are still common in many (mostly rural) areas, and the impression is still strong that Lowdermilk (5) was right arguing that "For 7000 years man has been looking for the ways toward a better life on this planet, which in fact has been a race with the famine, in which the winner is still unknown". On the other side, there is an abundance of food and a real war in the international markets.

According to the New Farm's data, financially supported agricultures of 25 highly developed countries receive around $160 billion through various subventions. In these countries, as stated by Demmler (3), the share of agriculture in total national investments is higher than it is in gross national income, in percentages. Hence, from the viewpoint of the Portfolio philosophy (cash investments) it can be presumed that in many countries agriculture is viewed as a profit-centre with a promising future. It seems that such an attitude is recognizable even in some of the countries traditionally faced with famine.

In general, the EEC countries have met their food demands and have even produced certain amounts of surpluses. According to Nemeth (8), in 1981 their demands for plant and animal products were already met by 114% and 105%, respectively.

All this suggests the conclusion that global interests of the mankind, in respect of agricultural land maintenance and the long/term food supply have been seriously affected. On the other hand, however, the developed countries are facing the problems of food overproduction, the necessity of reducing the arable land acreages, and soil conservation.

Previous researches

Previous researches focused mostly on the problems of production functions of production. By using different types of production functions the optimal combinations of fixed and variable plant production factors were searched for, i.e. the researches were aimed at defining the optimal intensity level. Analyses of production results by method of production functions have also shown a great variability of conditions, production results, production elasticity levels, justifiable or unjustifiable use of variable factors. By methods of linear programming, most often with several criteria of optimality, the problems of optimal production structures for various conditions were analyzed. However, until present the task of analyzing the optimal and, on the other hand, unjustifiable use of soil as a fixed production factor in plant production. Gradual introducement of market economy and more direct impact of market regulations will soon impose the problem of agricultural land use – in the first place for the purposes of regional development planning and urbanization.

Therefore a question is what agricultural land can be and on rational basis should be definitely excluded from production, to be used for other, non-agricultural purposes?

A possible solution

The problem of transformation of agricultural land for non-agricultural purposes is not only the question of ecological and economic significance. In the first place it is a strategic question since each national economy shows the tendency of food production self-sufficiency. In the case food commodities' surpluses are not the tradable ones, or the trade is not rationally justifiable, the question is: what agricultural land capacities should be used for nonagricultural purposes,

according to the criteria of economic justification? It should clearly be the worse quality soils; however, what areas precisely and what acreages – that is not so easy to decide on grounds of free estimations. The fact that various crops react differently on different types of soils make this problem even more complex.

The starting point in a model to be used for defining the potential "surpluses" of agricultural land are *demands* for particular quantities of particular agricultural products. The term "demand" includes self sufficiency and the possibility of export. In the long run, the annual quantities of particular agricultural products can be approximately defined which provide for self – sufficiency and offer good prospects of export (production Quota).

Since food production is the function of two parameters – acreage and average yield – the question is imposed of defining the economically optimal level of production intensity, and hence the economically optimal yield to aim to. However, the economically optimal yield is not a fixed category but depends on input/output prices parity which is strongly influenced by market interdependences and is therefore a changeable factor.

Under assumption of relatively stable agricultural input and output prices parity within the framework of agriculture, the problem of surpluses determination of agricultural land is possible formulate with multilevel linear programming model.

Objective function in this model will be maximum economic effectiveness (in terms of maximum gross margined) and maximum efficiency (in terms of maximum economy) of total national agriculture, like two basic economy criteria's, as absolutely and relatively business performance (10).

By compromise solution of model, on the basic alike respect of both criteria, is possible to define such production structure which will be (under available conditions) in the most degree simultaneously rationally exploit available agriculture production powers and realize high returns, for propose degree of production structure.

For getting of compromise solution in the preliminary steps it is necessary optimization on the basic of particular criteria.

Mathematical interpretation of multi criteria strategic model for definition the potential surpluses of agricultural land are:

1st step: Optimalization on the base of maximum effectiveness

1) Objective function

$$\sum_{i=1}^{m} \sum_{j=1}^{n} GM_{ij} S_{ij} = GM_{(max)}$$

2) Limitations of products – production quotas

$$\sum_{j=1}^{n} Y_{ij} S_{ij} = Q_i$$

3) Biotechnical limitations (crops rotations)

$$S_{ij} \leq p_{ij} S_j$$

4) Land limitations

$$\sum_{i=1}^{m} S_{ij} \leq S_j$$

Where is: i = 1 (1)m m = number of crops
j = 1 (1)n n = number of types of soil

GM_{ij} = gross margin of "i" crop on soil type "j" for optimal level of intensity (€/ha)
GM (max) = Agricultural maximum gross margin (€)
S_{ij} = Acreage under "i" crop on the "j" type of soil (ha)
Y_{ij} = Optimal yield of "i" crop on the soil type "j" (t/ha)
Q_i = Required quantities of "i" product (t)
p_i = Maximal participation "i" crop in production structure
S_j = Available acreage of "j" soil (ha)

2nd step: Optimalization on the base of maximum efficiency

1) Objective function

$$\sum_{i=1}^{m} \sum_{j=1}^{n} VP_{ij} X_{ij} = EP_{(max)}$$

2)

$$\sum_{i=1}^{n} Y_{ij} X_{ij} - qQ_i = Ø$$

3)

$$X_{ij} - qp_i S_j \leq Ø$$

4)

$$\sum_{i=1}^{m} X_{ij} - qS_j \leq Ø$$

5) Additional limitation of costs

$$\sum_{i=1}^{m} \sum_{j=1}^{n} VC_{ij} X_{ij} + qFC = 1$$

Where is:

VP_{ij} = Value of production"i" crop on soil type "j" for optimal level of intensity (€/ha)
$EP_{(max)}$ = Maximum economy of production
X_{ij} = Independent variable in the model
VC_{ij} = Variable costs "i" crop on soil type "j" for the optimal level of intensity (€/ha)
FC = Total fixed costs of agriculture (or total capital assets value) (€)
q = Additional variable

Acreage of particular crops, in this case, can be determinate after saluting of model from this relation:

$$\overline{S}_{ij}^{..} = \frac{\overline{X}_{ij}^{..}}{q}$$

3rd step: Compromise solution

1) Objective function
$d_1 + d_2 = D\ (\min)$

2)
$$\sum_{j=1}^{n} Y_{ij}^{..} X_{ij}^{..} - qQ_i^{.} = \emptyset$$

3)
$$X_{ij}^{..} - qp_i^{.} S_j^{.} \leq \emptyset$$

4)
$$\sum_{i=1}^{m} X_{ij}^{..} - qS_j^{.} \leq \emptyset$$

5)
$$\sum_{i=1}^{m} \sum_{j=1}^{n} VC_{ij}^{..} X_{ij}^{..} + qFC = 1$$

6) Additional limitation of difference from the maximal efficiency
$$\sum_{i=1}^{m} \sum_{j=1}^{n} GM_{ij}^{..} X_{ij}^{..} + qGM_{(\max)} + d_1 = \emptyset$$

7) Additional limitation of difference from the maximal efficiency
$$\sum_{i=1}^{m} \sum_{j=1}^{n} VP_{ij}^{..} X_{ij}^{..} + d_2 = Ep_{(\max)}$$

Where is: d_1 = difference from maximal effectiveness
d_2 = difference from maximal efficiency
D = total minimum difference from both criteria

Where also, like preliminary case, is current relation:

$$\overline{S}_{ij}^{..} = \frac{\overline{X}_{ij}^{..}}{q}$$

Conclusion

By solving this general problem of compromise broken programming (with food demands satisfaction) from relations of the in equation of limitation groups under 4), we obtain the information about reserve of particular soil type resources which are not included in optimal production structure. These reserves indicate what agricultural land acreages can potentially be used for nonagricultural purposes.

In this case we deal with a methodological, general – theoretic model the operationalization of which requires a number of parameters such as yield oscillations, deviations of optimal yields from the average ones, dynamics of movements in particular products demands, population growth, technical-technological progress in agriculture, etc.

In spite of its generality and insufficient precision, the presented model offers the potential framework and points out (alt least in general terms) the structure and acreage of agricultural land which is sooner or later supposed to be used for a changed purpose.

This kind of application of an optimization model doesn't require the local optimum of a particular producer, but a global optimum of a national or regional level. That is why an adequate strategic selection of parameters and aspects of logistic chains of production and distribution is automatically required. The neglecting of global environment parameters and an overestimation of the significance of those concerning local environment can easily lead to sub-optimizations.

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THE COMPETITIVENESS OF TOURISM AND RURAL TOURISM OFFER IN BOSNIA AND HERZEGOVINA THROUGH APPLICATION OF THE MARKETING APPROACH

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Abstract

This paper considers the essence, significance and necessity of application of the marketing approach, i.e. planning, organizing and control of marketing activities in tourist and rural tourist policy, intending to add to competitiveness of the tourism offer in Bosnia and Herzegovina. The paper elaborates theoretic and substantial aspects of marketing element in tourism and rural tourism, with a special view on importance and contribution of marketing approach in competitiveness of tourism and rural tourism offer in Bosnia and Herzegovina. The marketing approach in tourism and rural tourism, presented in this work, may serve as a basis for creating policy and developing marketing approach in B&H tourism and rural tourism.

Key words: marketing, tourism, rural tourism, conceptual model of tourism development, Bosnia and Herzegovina.

Introduction

The turbulent occurrences on the world service market which have been perceived on both the demand and as well as the supply side, require respect and application of marketing in overall business philosophy.

The marketing is a business function focused on satisfying needs and wishes of consumers through rational exchange. In our case the Kotler's definition of marketing is the most acceptable one: "Marketing is a social and managing process through which individuals and groups acquire what they need and what they want by creating and exchanging products and values with others."[4] The goal of this paper is to examine competitive advantages of tourism and rural tourism, to present the importance of marketing in tourism offer and to analyze options for development of rural tourism in Bosnia and Herzegovina.

The role, place and importance of application of marketing in tourism and rural tourism

Although origination and development of tourism may be observed from the birth of human civilization in comparison to other industry branches and activities its theoretical elaboration and practical application of the marketing concept started later. From the marketing point of view, at the end of the 1960s, a more serious treatment of the tourism, as an economic process, business

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4 Philip Kotler, John Bowen, James Makens ''Marketing for Hospitality and Tourism'', Third Edition, Prentice Hall, New Jersey, 2003. pp. 13.

concept and especially as a scientific discipline, started. This is period of theoretic elaborations and improvements of marketing in tourism as a scientific discipline.

Practical application of marketing in tourism (in relation to previously elaborated theoretical stand) happened with certain delay. The basic reasons of the later change of marketing in tourism may be covered in the following way:

The later application of the marketing in all service industries is the result of the influence of factors recognized as unique for all service industries, and of the occurrence of certain problems conditioned by particular characteristics of services. This is about characteristics of services such as: intangibility, indivisibility, heterogeneity.

Existence of a large number of business entities of small economic power on the side of tourist offer – which were not, due to lack of knowledge and means, interested in application of the marketing conception.

The tourist market is a relatively young market – its expansion started during 1950s.

Inventiveness in market economy was limited by longtime domination of the traditional approach to dealings in tourism and in that way it became an obstacle for application of the marketing concept in tourism and rural tourism.

Besides the mentioned obstacles, which set up conditions for the later application of the marketing conception in tourism, its role in finding balance between satisfying needs, wishes and requests of selected market segments and maintenance and improvement of wellbeing of consumers and society as a whole instigates a more intensive application of the marketing in tourism service industry. The marketing monitors turbulent changes in its environment, adjusts to them and in that way facilitates sale of products and services in accordance with demands and needs of tourists.

In the second half of the 20th century the marketing in tourism was a young scientific discipline which defined basic ideas and categories, analyzed concepts, methods and techniques, and set up scientific stands, theories and definitions.

From the time of origination of initial works until today a significant change in tourism, when it comes to concentration on individual elements and categories of marketing in tourism, as well as the very approach and defining of marketing in tourism, can be perceived.[5] In the first scientific works large attention was paid to defining a tourist product and to coordination of different activities on the level of tourism enterprises. Less attention was paid to coordination on the macro level. In contemporary works significant attention is given to marketing management in tourism i.e. planning, organizing and control of marketing activities of business enterprises operating in tourism, as well as tourist destinations.[6]

On the basis of these scientific researches contents of the marketing in tourism, as well as in rural tourism, can be determined. The contents cover "situational analyzes i.e. analyzes of external and internal environment, defining mission, goals and guidelines, establishing global

5 First definition of marketing according to Krippendorf: ''Marketing in tourism is to be understood as the systematic and coordinated execution of business policy by tourist undertaking at local, regional, state or international levels to achieve optimal satisfaction of the needs of identifiable consumer groups and in doing so achieve on appropriate return." Dr Jovan Popesku ''Marketing in tourism'', page 34. In contemporary domestic literature on marketing in tourism scientific works, articles, studies and papers of Prof. Dr S. Unkovic, Prof. Dr K. Cacic, Prof. Dr O. Bakic should be mentioned. They analyzed the marketing conception in tourism and confirmed possibility for its practical application in detail.

6 [6] Dr Ognjen Bakic ''Marketing in tourism'', page 21.

and individual strategies (and tactics) and marketing mix, designing level of organization and control and revision of all activities on both micro and macro levels."[7]

Starting from the characteristics of tourism as an economic activity, characteristics of tourist market and interest the society shows for its development, the marketing activities may be observed through two related forms of activities:

- marketing as a basis for business policy creation and management of tourist industry enterprises, and
- marketing as a basis for business policy creation and management on all levels (micro and macro levels).

Based on application of both forms of marketing in tourism it (tourism) can be defined as a coordinated activity of business and tourist policy bearers with an aim to achieve optimal satisfaction of needs of selected/targeted market segments along with accomplishment of maximum economic results and respect of the influence on social and natural environment and achievement of satisfactory quality of life.

Therefore, application of marketing in tourism, especially as a business conception, is supposed to contribute easier process of exchange at international and domestic tourist market.

The following main reasons may be pointed out to accept the marketing concept in tourism:[8]

- changed relations between supply and demand at the tourism market conditioned the need to leave traditional sales orientations of bearers of the tourist offer and to accept marketing concept;
- the tourism market, as a relative young market, provides enough space for introduction of innovations;
- the tourism market has considerable level of competitiveness;
- high level of the fixed costs in organizations within tourism field puts the capacity utilization in the first plan;
- flexibility of demand, inflexibility of supply, and primarily the service character of tourism imposes significance of providing a stable long-term demand;
- diversity of the tourism demand and socio-psychological factors make influence on behavior of consumers in tourism.

Taking into account the mentioned attributes of the tourist supply and tourism demand, application of marketing in tourism is very logical and reasonable. Its use should balance relations between, on one side, needs of business entities on the side of tourist offer to maximize their target function (to gain as high profit as possible), and requirement of the tourism demand to find appropriate advantages and gain expected benefits through satisfying its wishes and needs, on the other side.

The basic purpose of marketing in the business entities operating in tourism and rural tourism is to provide successful functioning on the tourism market along with appropriate adjustment to social and natural environment.

Successful adjustment to turbulent changes on the tourist market as well to the final goal of profit making must be based on application of the marketing concept by all bearers of the tourist activity. Tourists and satisfying of their wishes and needs are in the focus. Their largely expressed sophistication in the recent years encourages tourism related business entities to

7 [7] Dr Jovan Popesku ''Marketing in tourism'' page 35

8 Adopted according to Dr J. Popesku, op. quote, page 33.

create new programs and organize travel events.[9]

If the tourism related business entities offer what consumers, i.e. tourists, want in the manner, at the place and with the quality and price in which they expect it, business goal will be accomplished. The tourism related business entities should make offers which will not be based on their own capacities only, but also on knowing needs and requests of consumers. For the tourism related business entities to operate successfully and rationally and to meet the mentioned demands their business policy has to be founded on application of a marketing conception.

Marketing management on the level of tourist and rural tourist policy

In recent years in the marketing of tourism the managing aspect of marketing (marketing management) is gaining in importance, i.e. how and in what way to plan, organize and control all those numerous tourist activities which simultaneously happen on micro and macro levels.

There are more and more pieces of evidence that without management which encompasses planning, organizing and control of all activities (especially marketing activities) there is no real market, economic and tourist valorization of one country at the tourist market. Also, this process coordinates and motivates executors of business activities to work better and to make more profit. It means that the task of the managing process is to arrange tourist destinations' business as an effective and efficient one. In this case, the efficiency implies that tourist destinations define and direct their activities according to requirements of targeted tourist environment (to do right things). Also, efficiency encompasses methods applied by tourist destinations which enable achievement of business results with the least possible involvement and spending (to do right things in right way).

Besides the marketing management on the micro level i.e. on the level of a tourist company, marketing management on the macro level i.e. at the local, regional or national level (level of the tourist destination), is equally important.

The tourist destination is "a more or less organized geographic unit which possesses attractive, communicative and receptive factors i.e. all natural, social, anthropogenic, cultural-historical, traffic, accommodation, food, entertainment, recreation, relaxation related preconditions (complete tourist offer)."[10]

Managing tourism on micro and macro levels requires focus on a larger number of factors, orderly sequence of moves for the purpose of establishing of the marketing strategy and tactics, as well as structure which will help in realization of established marketing goals of every tourist destination.

The global conceptual model of tourism development, i.e. marketing management of tourist destination is supposed to contain the following spheres of action:[11]

1. situation analyses (analyses of economical, technological, demographical and other changes in the environment as well as the analyses of internal resources);
2. formulating missions, goals and guidelines;

9 Dr Krunoslav Cacic ''Enterprises operating in tourism'', Faculty of Economy, Beograd, 1995. At the end of XX century social marketing as philosophy in which tourism related business entities strive to integrate long term profits through satisfaction of wishes and needs of tourists/consumers started to dominate.

10 Dr Ognjen Bakic ''Marketing in tourism'' page 69.

11 Dr Ognjen Bakic ''Marketing management of tourist destinations'', Faculty of Economy, Belgrade, 2002, page 30.

3. formulating appropriate strategies (differentiation of tourist product, segmentation of market, image profiling and positioning);
4. defining strategic and tactical moves related to each of the marketing instruments (tourist product, price, promotion, sale channels);
5. organization (state and para-state bodies) with managerial support systems; and
6. control of activities.

The marketing management process of a tourist destination consists of a number of sequential iterative steps.[12]

The initial step in managing marketing of a tourist destination consists of the analysis of environment (macro environment, market and competition) and analysis of internal resources. The macro environment covers changes and events in economic, social, technological and other environments. Changes in market environment, as well as behavior of competition, need to be observed as well. When doing this analysis chances are to be used and threats are to be avoided. Analysis of internal resources represents establishing of weak and strong points. The weak points need to be eliminated and the strong ones used as mach as possible. At the end, internal competencies need to be connected with external potential through application of the SWOT analysis.

After the situation analysis, defining mission, goals and guidelines of a tourist destination follows. Defining of mission represents the purpose and reason for existence, and therefore it has to be clear and based on realistic presumptions. The goals and guidelines represent elaboration of a defined mission. The goals determine where a destination "wants to go", "what it wants to achieve", while the guidelines represent their quantitative determination.

Formulating the destination's strategy, meaning differentiation of the product, segmentation of the market, profiling the image and positioning, is the next important step. In order to facilitate strategic selection of the tourist destination different conceptual models are applied, primarily the product portfolio concept (tourist destination decides what to do with every concrete product) and portfolio product/market (tourist destination decides which product to place and on which markets).

Formulating the strategy for marketing instruments (marketing mix, product, price, promotion, and sale channels) is the next.

Defining organization through coordination of all participants in offering a tourist product and control and revision of the whole activity are the last two phases.

Development opportunity of rural tourism in Bosnia and Herzegovina

Rural tourism supports development of new tourist destinations giving especial contribution to development of the continental tourism. Basic characteristics of this type of tourism are family owned-farms, which mostly provide their own existence through agricultural production. In this manner, family-owned farms could sale surplus of their products to tourists in visiting. It is a way for family-owned farms to provide additional income by engagement of members of family. If we anticipate opportunities such as rent of accommodation, catering services and other kinds of services for tourists then possibility for family-owned farms to incur additional incomes is even larger.

12 Philip Kotler "Marketing Management: Analysis, Planning, and Control", page 80.

Rural areas are not intended especially for agricultural-production activities. Long since, level of social-economic development of these areas is defined based on proportion of intensity of the agricultural production and management of forests in regard to utilization of rural are for other purposes (*Cejvanovic and others, 2006*). Role of agricultural production and utilization of forestry products is inversely proportional to the level of development. Nowadays, rural areas become main bearers of:

- housing needs of population,
- functions of agricultural and industrial production,
- infrastructural needs of urban areas,
- spaces for spending free time.

Regarding rural areas in B&H, there is a need to point out that 81% of total area and 61% of its population can be qualified as rural. According to the OECD criteria, areas with density of population lower than 150 citizens/km^2 are considered rural. There are 143 municipalities in B&H, out of which 114 can be qualified as rural, with population of 2.372.162 (*Report on agriculture in B&H, 2007*).

This definition indicates to one aspect of rural areas, but disregards important differences which exist between rural areas, as well as important contribution of rural resources to social, economic, tourist and cultural developing processes. Diversity of rural areas is significant element of the rural development policy, as well as development of agro-tourism.

The concept of rural tourism has an important role in sustainability and reconstruction of rural areas. Importance of the rural tourism in chain of the sustainable development happened due to capability to valorize natural characteristics and environment as an economic resource.

The following principles of rural tourism organized in this way are: rational relation toward resources of given area, monitored and planned development and sustainability of the system.
These principles are basic guiding principles in the process of planning and realization of development of rural tourism, and the reason for that is influence of the rural tourism on local population, their way of life, culture, tradition, etc.

Although besides the term "rural tourism" there are other terms in use, such as: eco-tourism, village tourism, agro-tourism, tourism at family-owned farms, eco-rural tourism and similar, it indeed means concept of tourism being practiced at family-owned farms and uses rural areas in the context of its tourist offer.

There is need to point out that the Federation of Rural Tourism held in Spain, in 2003, was the first European congress on rural tourism (*Djuric, 2007*). Potentials and basic characteristics of development of rural tourism in 23 European states were presented there. Participants pointed out (representatives of 35 countries were presented) that 200,000 business entities, which provide services in rural areas, were registered in Europe, which had over 2,000,000 million of beds at their disposal. Number of beds available in family-owned farms at that time was 1.5 times higher than the capacity in whole Spain, which is the second most important destination in Europe.

Experts say that accommodation linked with rural tourism attracts annual tourist consumption of about EUR 12 billion. If multiplicative effects of the tourist activity are built-in then the assessments reach the amount of about EUR 26 billion. Estimated number of directly and indirectly employed people is 500.000.

Evaluations of the World Tourist Organization have shown that demand for services at family-owned farms has been constantly growing in the last 15 years.

The highest growth rates have been noticed in some of the countries of the Southern and Eastern Europe. Since public is getting increasingly interested in its sustainability there is even more reason to contribute to the development of the rural tourism. Sustainability is its main component.

Bosnia and Herzegovina has unlimited capabilities to develop the rural tourism in its rural areas. There are potentials for self-development of the rural tourism along with development of agriculture in the B&H rural areas (*Vujovic, 2007*).

The rural tourism offer in B&H can be divided in several basic groups:

- recreational and educational events: visits to some agricultural households, organization of outdoor schools, youth education programs, activities on farms for specific groups of tourists,
- sports and recreational events: riding horses, paragliding, extreme sports, biking, hiking, running, different sport activities, hunting, fishing etc. can be organized on different rural localities;
- gastronomic offer: home made brandy, wine, juices, meat products (veal, pork, sheep, goat…), home made dairy products, home made cheeses, bred, grain products, fruits (plums, apples etc.)…

These are only basic tourist offers which can be organized in the BD of B&H rural areas. Certain combinations can make the quality of the offer even more attractive.

Conclusion

When starting with marketing studies one has to begin with the fact that studying of a very complex system, which is with numerous ties and influences nested not only in earning but in society and life in general, is in question. Although marketing is activated in production (of products and services), its reach spreads quite far. Today marketing functions on all levels of the industry, not only on the level of exchange of goods but also in health and education systems, in tourism, sports etc., i.e. in the service industry.

Considering specific characteristics of the tourism market: heterogeneity of demand (needs of those who make demands are heterogeneous), elasticity of demand, sensuality, rigid and inelastic offer, it is clear that the tourism market demands application of marketing as a business concept and integrated marketing as a form of organizing on all levels, both micro and macro. In the recent years in tourism and tourism policy, as well as in the related literature, the marketing management is gaining on importance - in other words, in what way to plan, organize and control all numerous marketing activities in tourism on the micro and macro levels.

Analysis of the rural areas the B&H were observed with regard to a potential development of a tourism and agriculture and benefits for defining specific rural tourism differentiated products that may be interesting not only for domestic but also foreign tourists. Main offers rural tourism in B & H is reflected through: recreational and educational facilities, sports and recreational facilities, gastronomic, as well as other activities in the village. Offer agricultural products in the rural tourism B&H create the possibility of connecting and sales of agricultural products from different manufacturers. Rural tourism as a complementary activity is chance to family farms to increase income economies, as well as the ability of rural development in B&H.

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ALTERNATIVE FUTURES OF RURAL AREAS IN THE EU: A COMPARATIVE ANALYSIS OF SCENARIO STUDIES

Kristina M. Jansson[1], Ida J. Terluin[2]

Abstract

What does rural Europe look like in 2030? Is agriculture still the main land user? In recent years, studies such as ESPON, Eururalis, SCENAR2020, SENSOR, SEAMLESS and PRELUDE have tried to address these questions. These studies resulted in a number of alternative futures of rural areas in the EU.

In this paper a comparative analysis of these scenario studies is made in order to explore differences and similarities in the scenarios and alternative futures of rural areas in the EU. For this purpose, we designed a scheme for assessing the properties of the various scenarios and a scheme for a systematic description of the rural futures according to the scenarios.

It appears that most scenario studies use a baseline scenario and a set of alternative scenarios with different degrees of policy regulation. Agriculture will continue to be a main land user in 2030, although some land abandonment will take place.

Key words: Rural Europe, scenario studies, alternative futures, land-use, territorial disparities

Introduction

What does rural Europe look like in 2030? Is agriculture still the main land user? Is there large scale land abandonment? Does climate change affect the suitability of rural areas for agricultural and residential purposes? Have many urbanites left the cities and settled in rural areas? Has the quality of landscape and environment in rural areas deteriorated or has it been improved? Are rural regions an integrated part of the European economic centre, or have they become marginalized? The answers on these and other questions could help to create an image of the future of rural Europe. In recent years, a number of scenario studies have tried to address these questions, like ESPON (ESPON Project 3.2, 2006; 2007), Eururalis (Rienks, 2008), SCENAR2020 (Nowicki *et al.*, 2006), SENSOR (Kuhlman *et al.*, 2006), SEAMLESS (Pérez *et al.*, 2007; Van Ittersum *et al.*, 2008), PRELUDE (EAA, 2007) and 'Agriculture in the overall economy' (Banse and Grethe, 2007).

The alternative futures of rural areas in the EU in the above mentioned studies were designed as scenarios. By definition, a scenario is neither a forecast nor a prediction, but should be understood as a coherent, internally consistent and plausible description of a possible future state of the world (EAA, 2007). Usually, a scenario starts from assumptions on the development of a number of external drivers, like population growth, economic growth and climate change. These provoke local responses in rural areas, for example, by entrepreneurs, consumers and policy makers. The specific interplay of external forces and local responses colours the rural future. The

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range of possible rural futures put forward by the various scenario studies might serve strategic thinking about some of the key challenges rural Europe may face in the field of agriculture, rural development, land use and the environment (EAA, 2007).

The aim of this paper is to explore alternative futures of rural areas in the EU. For this purpose, a comparative analysis of seven recently published scenario studies of rural areas in the EU is carried out. From this analysis a set of alternative futures of rural areas in the EU is identified.

In section 2, we discuss some methodological issues on the design of scenarios and we introduce schemes for assessing the properties of scenarios and for a systematic description of the rural futures according to the scenarios. In section 3, we make a comparative analysis of the scenarios. In the final section, we give some concluding remarks.

Methodological approach

Different methods can be used for describing the future, like literature reviews, scenarios, brainstorming and expert panels (EFMN, 2006). The exploration of rural futures in Europe in this paper is restricted to scenarios. In this section we first discuss some methodological issues on the design, content and nature of scenarios. Second, we design a scheme for assessing the properties of the various scenarios used in the scenario studies and a scheme for a systematic description of the rural futures according to the scenarios. These two schemes are used in the comparative analysis of the seven scenario studies.

Approaches to the design of scenarios

Kuhlman *et al.* (2006) distinguish four different approaches of the design of scenarios:

1. extrapolating approach, in which the current trends are extrapolated;
2. expert judgment, in which experts describe possible futures;
3. inclusive approach, in which a set of future worlds is described and the 'real' future is hopefully somewhere in between;
4. imaginative approach, where a set of futures is described, which need not to be plausible.

Scenario content characteristics

Various characteristics of the contents of scenarios and their range are presented in Figure 1. The temporal nature reveals whether the scenarios show the whole chain of events leading up to the point in the future that is analysed in the study, or if just the end point is shown as a snapshot. The level of heterogeneity and the origin of the variables can vary: heterogeneous variables cover a wide range of fields, whereas homogenous variables include variables of one field. The dynamics in the scenario mirrors the changes that can be built into the scenario: a discontinuous scenario allows for breaks whereas a trend scenario does not. The level of deviation indicates how far apart the scenarios in a study are. The dimension of the scenarios may refer to a reference scenario plus a number of alternatives or a set of contrasting futures derived from opposite dimensions of main future directions. The level of integration shows to what extent the components of the scenarios are put together to form a whole. Finally, the level of quantification and qualification refers to how thoroughly the scenarios are described.

Figure 1. - Scenario content characteristics

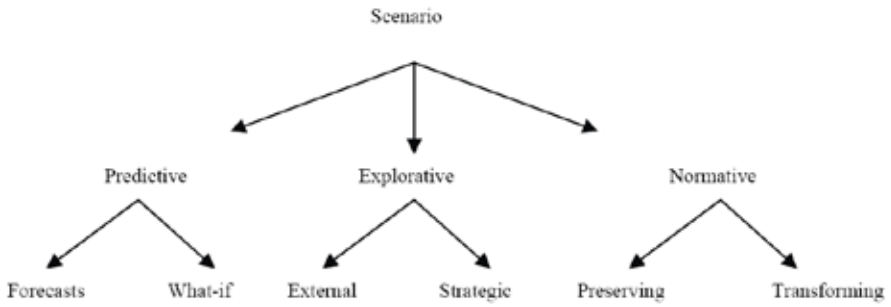
Characteristics	Range		
Temporal nature	chain of development	⟷	snap-shot at the end
Nature of variables	heterogeneous variables	⟷	homogenous variables
Origin of variables	external factors only	⟷	external and internal factors
The nature of the dynamics	discontinuous scenario	⟷	trend scenario
Dimension of the scenarios	reference plus variants	⟷	contrasting futures
Level of deviation	alternative scenarios	⟷	conventional scenarios
Level of integration	high integration of components	⟷	low integration of components
Level of quantification/ qualification	skeleton	⟷	storylines

Source: Van Notten et al. (2003); IPCC (2005); adaptation LEI.

Nature of scenarios: predictive, explorative and normative

Börjeson *et al.* (2006) make a distinction of scenarios according to their nature (Figure1). The three categories predictive, explorative and normative are based on the questions: 'What will happen?', 'What can happen?', and 'How can a specific target be reached?' As a next step, each category is divided into two subtypes. Forecasts usually include a reference scenario plus a high and low alternative, whereas in what-if scenarios the future effect of a certain decision is analysed. External scenarios answer the question what can happen to external factors, while strategic scenarios address the question what can happen if we act in a certain way. Preserving scenarios respond to the question 'How can we reach the target by adjustments to the current situation?' while transforming scenarios respond to 'How can the target be reached when the current structure blocks change?'

Figure 2 - Scenario typology according to their nature



Source: Börjeson *et al.* (2006).

Scheme for assessing and describing scenarios on rural futures

The assessment scheme for structuring our analysis of the scenario studies (Table 1) was designed based on the scenario typologies presented in the previous section. In the next step, a framework for a systematic description of the images of the rural futures in the EU was developed (Table 2).

Table 1 - Scheme for assessing scenarios in this study

Name of the study	
1. Source/Report reference	
2. On-line source	
3. Sponsor	
4. Geographical scope	
5. Spatial unit	
6. Objective of the scenarios	
7. Number and names of the scenarios	
8. Time scale	Start and end year of the scenarios.
9. Nature of the scenarios	Are the scenarios predictive, explorative or normative?
10. Nature of data used	Are data quantitative or qualitative?
11. Method of data collection	
12. Temporal nature of the scenarios	Do scenarios describe a chain development or a snap-shot at the end?
13. Nature of the variables	Are the used variables homogeneous or heterogeneous?
14. Inclusive or imaginative approach of scenarios	Is the 'real' future hopefully among the described scenarios or is a group of possible futures described?
15. What are the drivers in the scenarios?	
16. Methodology for calculating scenarios	Indicate which methodology has been used: • extrapolating trends; • models; • expert judgement; • other
17. Variables used to describe the images of the rural future	

Table 2 - Scheme for describing the images of the rural futures in the scenario studies

Name of the study	
1. Name of the scenario	
2. Description of scenario	Describe endogenous and exogenous drivers.
3. Image of the rural future	Describe rural futures and distinguish the following items: 3a General developments; 3b Sectoral employment and employment growth; 3c Agriculture; 3d Landscape, nature and biodiversity; 3e Other considered items.

Comparative analysis of scenario studies of rural areas in the EU

In this section we make a comparative analysis of seven scenario studies of rural areas in the EU, based on the two schemes designed in the previous section. The studies are Agriculture in the overall economy, ESPON, EURURALIS, PRELUDE, SCENAR 2020, SEAMLESS and SENSOR.

Scenario description

The seven scenario studies aim to explore future trends and driving forces, shaping rural areas in Europe within a dynamic global context, and to anticipate how different policy systems would themselves impact on rural areas. The precise meaning of 'rural areas' differs among the scenario studies, varying from a wide territorial approach to a more narrow sectoral approach. The time horizon in the scenario studies varies from 2020 to 2035.

The construction of a baseline scenario - derived from an extrapolation of past trends and policies - combined with a number of alternative scenarios with different degrees of policy intervention, is the most common approach of the scenario studies. Usually, these alternatives refer to a liberalization scenario with a low degree of policy regulation and a cohesion scenario with a high degree of policy regulation. The construction of scenarios in PRELUDE and Eururalis deviates from the other scenario studies. PRELUDE assumes a number of disruptive events in the near future. These disruptive events are amongst others a strong decrease in societal solidarity, severe flooding, an international energy crisis, heavy air pollution in urban areas, a food security crisis and environmental disasters. These events provoke a series of 'new' population and policy responses, resulting in images of the rural future in Europe that highly deviate from the present situation. Eururalis employs a set of four contrasting futures, derived from opposite dimensions of policy intervention and global market integration.

In all scenario studies, macro-economic growth and demographic changes are included in the exogenous drivers. Also policy drivers are included in all studies, for example CAP, transport policies, EU enlargement and R&D policies. Some studies also use technological progress, energy prices, climate change, consumer preferences, and norms and values as drivers.

All scenario studies use a multi-model framework referring to different spatial levels (world, EU, region, grid) and to different aspects of the rural world. Sometimes already existing models were used, like GTAP, ESIM, CAPRI and CLUE; in other cases new models were developed, like the MASST and the KTEN models in ESPON and the FSSIM-EXPAMOD and the APES models in SEAMLESS.

Images of the rural futures in the EU according to the scenario studies

Together, the seven scenario studies result in 19 different rural futures. SEAMLESS and SENSOR deviate from this in that they do no produce images of rural futures but interactive tools. By using the assessment scheme given in Table 3, the 19 alternative futures were divided into a smaller set (Jansson and Terluin, 2009). We first distinguish three rural futures that are derived from the level of policy intervention:

1. *rural future in the EU: baseline*

Globalisation has a strong and accelerating influence on the process of job creation and destruction. Metropolitan regions with advanced technologies benefit. Population stabilizes in the EU; however, remote rural regions face depopulation. Drought has led to agricultural abandonment in Southern Europe. The production of biomass and energy crops gives a new

impetus to agriculture. Agricultural production in 2020 needs 91% of the agricultural land used in 2000/2002.

2. *rural future in the EU: competitiveness*

All efforts are concentrated on increasing global competitiveness. The economy flourishes with a high level of technological innovation. Territorial disparities increase between metropolitan areas and other areas. There is rapid and radical liberalization of CAP. Agriculture intensifies, becomes high-tech and concentrates in areas that are optimal for production. Agricultural production in 2020 needs 86% of the agricultural land used in 2000/2002.

3. *rural future in the EU: cohesion*

Support for technological development is concentrated to less-favoured regions. Non-metropolitan areas benefit. There is net migration from the most densely populated urban areas towards peripheral regions. Ambitious policies on environmentally sustainable regional development and minor CAP reforms (mainly modulation). Farming is high-tech and increasingly organic. Agricultural production in 2020 needs 96% of the agricultural land used in 2000/2002.

As PRELUDE does not start from the degree of policy intervention, we also distinguish three rural futures according to disruptive events:

4. *rural future in the EU: clustered networks*

Migration away from polluted urban areas is encouraged. Fourteen new medium-sized cities outside the main urban centre are created. These generate changes in infrastructure, employment opportunities and activities in peripheral regions. Globalization propels economic growth. Deepened international trade relations lead to marginalisation of agriculture and production continues only in the most favourable areas. Due to large scale land abandonment, the amounts of crop land and grassland have decreased by about one third in 2035.

5. *rural future in the EU: lettuce surprise u*

A major food security crisis hits Europe in 2015. As management during this crisis fails, faith in central government and in food security decreases strongly. Political decentralization becomes prominent and policy focuses on enhancing the quality of life. Environmental awareness grows, as does demand for sustainable produced food. Due to technological innovations, new crop varieties are invented that enable higher yields with lower inputs. Agriculture in core production regions becomes high-tech, clean and relatively small scale. Due to increased productivity in agriculture, the amount of crop land (-40%) and grassland (-20%) decreases by 2035.

6. *rural future in the EU: big crisis*

A series of environmental disasters in 2015 highlights Europe's vulnerability and inability to adapt effectively. After these crises, policies focus on a movement of population from the urban centre of Europe to its periphery. There is a widespread support for sustainable and regionally balanced development at EU level. Agricultural intensity is low. The main focus is on landscape stewardship. The use of crop land and grassland remains more or less stable.

Concluding remarks

In this study we explored alternative futures of rural areas in the EU. For this purpose, we made a comparative analysis of seven scenario studies of rural areas in the EU: ESPON, Eururalis, SCENAR 2020, SEAMLESS, SENSOR, PRELUDE and 'Agriculture in the overall economy'.

Often, these scenario studies constructed a baseline scenario – derived from an extrapolation of past trends and policies – and a number of alternative scenarios with different degrees of policy intervention. PRELUDE and Eururalis, however, deviate from this approach. PRELUDE assumes a number of disruptive events in the near future, whereas Eururalis employs four contrasting scenarios, derived from opposite dimensions of policy intervention and global market integration. We were able to derive six distinct alternative futures of rural areas in Europe from the scenario studies: 1. baseline; 2. competitiveness; 3. cohesion; 4. clustered networks; 5, lettuce surprise u; 6. big crisis. For agriculture many different futures are outlined: intensification, industrialization, high-tech varieties with higher yields and lower inputs, focus on organic production, new impetus of biomass and energy crops, marginalization and land abandonment. In 2035, projections of agricultural land use vary from two thirds to 100% of current land use.

Policy implications

The images of a competitive and cohesion rural future reflect the dichotomy in regional policies of efficiency versus equity. A competitiveness approach with a low degree of policy intervention boosts economic growth and regional disparities, while a cohesion approach with a high degree of policy intervention results in slower economic growth with less regional disparities. The current financial crisis of the world economy seems to confirm that disruptive events, as assumed in PRELUDE, are not pure imaginative events, but might be among the set of possible rural futures. This reveals that main challenges for Europe's rural future are not necessarily contained within the dichotomy of competitiveness versus cohesion. On the contrary, these challenges require new policy approaches, that might depart in many respects from the policies applied up to now (ESPON Project 3.2, 2006).

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AGRICULTURAL EXTENSION SERVICE IN THE FUNCTION OF RURAL DEVELOPMENT

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Abstract

Agriculture and agricultural extension service are facing numerous problems in present times when good solutions are not easy to find.

Providing of agricultural extension service is important foreign-political instrument of a state which has stimulates the development of agricultural production. Agricultural extension service must provide effective link between holdings-producers, agricultural research and other sources of information. Agricultural extension agents must be aware of psycho-social and social aspects of group action and individual counselling.

Therefore, one of priorities in agricultural development of our country is rising of the level of extension operation and establishment of extension service based on modern principles. This is the reason why in this paper, some of the traits of the genesis of extension services were indicated, as well as types of extension services and models of the organization, financing and human resources at disposal and structuring of these resources according to main characteristics, for the purpose of modernization and agricultural and rural development.

Key words: agricultural extension service, types, models, functioning, human resources

Introduction

Extension service in agriculture is indispensable and it offers more than just expert assistance in improvement of production and processing, it also enables flow of information and transfer of knowledge and scientific findings to practice. These activities are performed according to rules which regulate establishing of organization, functioning, goals and fields of operation, ways to execute extension activities by the extension agent, their obligations and rights.

Extension service has undergone numerous changes and has influenced unevenly application of certain scientific achievements in the practice.

It took Serbia over one century to reach comprehensive institutionally established and organized service.

Forming of the service started in the period 1953-1960 through network of agricultural stations and forming of the Department of animal recording and livestock selection, which was subsequently unified by establishing of the Institute of science Application in Agriculture.

Agricultural extension activity is important agrarian-political instrument of the state which stimulates the development of agricultural production.

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Agricultural extension service has to be competent in agricultural skills, to communicate efficiently with producers and stimulate them to acquire new knowledge.

Dominance of large number of small family farms, holdings and need to adjust to new scientific achievements and results, as well as lower educational level of agricultural producers, compared to workers in other fields of economy and industry, in numerous World countries has lead to forming of special institutions as part of their own policies of technical-technological development of agriculture, and these institutions would be engaged in application of scientific results in agricultural production.

Development of expert extension services in agriculture

First association of farmers was formed in Scotland in year 1723. Similar associations were formed in France in 1756, in Denmark in 1769 and in England and USA in 1784.

Analysis of the organization and functioning of extension service in developed world countries and their experiences in this activity are of course very useful for institutional organization of innovation in the field of agricultural technology and knowledge.

Developed countries on other continents formed their own national extension services at the end of 19th and beginning of 20th century (Australia 1890, Canada 1907, New Zealand 1910, USA 1910).

In Japan, national extension service was established in 1898, but farmers didn't accept it before 1910 and under force.

Diffusion of extension forms is common characteristic of agricultural extension service all around the world. It is pointed out that in the future, private initiative will gain importance in this field. In a broader sense this occurrence can be characterized as a phenomenon "untying of businesses in companies (DRUCKER 1990)."

Extension service in Serbian agriculture is organized through joint Agricultural expert/ extension services of the Republic of Serbia (active in the form of institutes, stations, departments, etc.).

Before 2009 they all operated in public sector and were coordinated by the Institute of Science Application in Agriculture and experts from agricultural cooperatives and food industry.
Approximately 750 persons were employed in 35 agricultural services all over Serbia, in the Institute of Science Application in (IPNP) and 34 regional agricultural services (13 in Vojvodina, 20 in Central Serbia and 1 on Kosovo and Metohija).

Every extension agent is obligated to follow the latest scientific and expert results, findings and achievements related to his field, also to develop skills and improve knowledge of the methodology of extension work and have to participate in certain seminars every year.

Mutual interests cause organizational and economical links between state/government, producers, processors and extension service.

It is true that in 2009, extension service went from public ownership to state ownership, which means that the state, i.e. Ministry of Agriculture, Forestry and Water Management became the founder of extension service.

Consolidation of extension service is expected in defining of the rules of the operation of agricultural services, through rulebook on conditions, requirements and ways to provide extension service to agricultural producers.

Characteristics of different types of extension work

Depending on the concept and main tasks of the extension service it is possible to define following types of extension work:

1. **Compulsory extension service** is related to the early stage of the development of agriculture when farmers are economically dependant and are at the lowest educational level, so for the purpose of achieving certain goals the legalized forcing is used and punishing of those who wouldn't subdue to this obligation.

2. **Economical extension service,** this type of extension work is possible in market conditions and uses economical incentives for realization of its goals, and its efficiency is demonstrated in capital deficiency.

3. **Educational extension service** provides, offers opportunities for learning through educational materials, publications, organizing of short courses, study trips, etc. This type of extension work is used for protection of the environment and nature.

4. **Universal extension service** established on legal basis and using economical incentives such as:

- price bonus/recourse
- insurance incentives
- lower interest rates
- assistance in organization of the market.

This type of extension service is very effective when economical and educational levels of farmers are high.

5. **Optional extension service** is based on free will of the farmers to receive advice and information on their request and if needed. It is efficient in circumstances when farmers are able to develop and progress on their own, give initiative and have sufficient level of financial resources.

Scope of activity and tasks of extension service

Agricultural extension service has the objective to assist family holdings or farmers in improvement of the methods and techniques of agricultural production, farm management, and increase of income and of productivity and production quality, increase of standard of living and elevating of social and educational standards in villages.

Objective is to help the farm i.e. holding to gain new information and develop new abilities, as well as to apply directly on the farm the latest scientific knowledge (transfer of technology).

- Extension work related to technological, economical and protected area of agricultural operation.
- Extension work in development of new guidelines for small and medium enterprises and agricultural holdings. Investments, business plans, plan for development of regions for

agricultural production and processing, and additional activities.
- Extension work and assistance in adoption of measures of agrarian policy (assistance in submission of requests and documents for subsidies and other calls, providing information and keeping records).
- Assistance in organization and work of organizations for primary production and other forms of producer associations.
- Building of capacity of agricultural producers for more successful managements of the farm/holding.
- Directing of rural development of the local community.
- Preservation of natural resources and environment (sustainable development).
- Directing and harmonizing production with natural resources and market demands, as well as development of entrepreneurship in agriculture in rural areas.
- Inducing forming of producer associations and other social groups in the villages.

Set goals can be realized if the service is keeping up with latest scientific results and EU trends and market demands, relying on the results, knowledge and experience of scientific, research and expert educational institutions in agriculture. Extension service must establish good cooperation with all mentioned institutions.

Education of agricultural producers with review of selected agricultural holdings

Providing information and educating agricultural producers (beneficiaries) can be realized by extension agents by organization of different expert lectures requested by producers on different locations and different periods. Most often such lectures are organized in winter time and they are harmonized with producers' needs.

Priority in the work of extension agents are selected agricultural holdings which are carriers of the production, role model in regard to quality of product and economical efficiency of the production.

Extension agent is obligated to establish good communication with each selected holding and to develop work program which would relate to improvement of organization and economical efficiency of production.

All types of extensions services provided by extension agents are recorded within typology of advices and services.

Methods of work of extension service

Extension work is realized in application of several methods: individual, group and mass extension methods.

- Individual extension methods represent intensive method of extension work. They are applied in form of house visits and advisory discussions, talks (visit to the farm, field, etc.), practical demonstration methods, farmer going to the extension office, etc.
- Group extension methods provide relatively broad spectrum of influences on beneficiaries of extension services. Types of group extension methods are diverse: expert lectures, group discussions, "field days", and group extension work in training centres for villagers and farmers, working groups for farmers and so called "extension clubs", different types of demonstrations of experimental results and new work techniques, expert excursions and trips, mutual (informative) meetings, etc. Group extension work can be realized in groups formed

with the idea to improve extension work (for instance farmer groups, extension clubs, etc.) or work with producer associations (producer associations, cooperatives, etc.).

- Extension work by way of mass media includes use of television and radio stations, expert brochures, expert articles in newspapers, leaflets, internet, etc. Each of the new media has its own specific traits and depending on these traits they can be used for informing and educating potentially large groups of agricultural producers. Extension agents are obligated to use all types of mass media using clear extension forms (short, clear, unambiguous and expert presentations, work instructions and solutions for certain production problems, etc.).

Human resources in agricultural extension service

Unique strategy of integral rural development (which includes development concept of agriculture) includes clearly and precisely defined human resources policy whit aim to manage human potentials at our disposal within extension service. Human resources policy relates to planning of future needs related to extension service, from the stand point of following aspects total number and structural characteristics, engagement in certain rural regions, i.e. territorial distribution and expert competence of the employees.

Researches carried out by Jovan Samardžija and associates (12) show that on the territory of Republic of Serbia, of total number of employees in agricultural extension service, 52,02% is in Vojvodina and 47,98% in Central Serbia.

Table 1 - Number and structure of employees in republic and regional agricultural services in Serbia (2002)*)

Qualification	Total AES		republic		regional	
	number	%	number	%	number	%
Qualification of extension agents						
Ph.D.	34	5,7	5	17,2	29	5,2
M.Sc.	33	5,6	5	17,2	28	5,2
Specialists	7	1,2	1	3,5	6	1,1
Graduated engineers	252	41,9	11	37,9	241	42,1
Other	266	45,6	7	24,1	259	46,7
Total	592	100,0	29	100,0	563	100,0
Educational profile of extension agents						
Crop production	98	30,1	2	9,1	96	31,8
Livestock prod.	73	22,4	15	68,2	58	19,1
Fruit and wine growing	31	9,5	2	9,1	29	9,5
Plant protection	68	20,9	1	4,5	67	22,0
Mechanization	8	2,5	1	4,5	7	2,3
Technology	29	8,9	-	-	29	9,5
Agro-economy	7	2,1	-	-	7	2,3
Melioration	10	3,1	-	-	10	3,3
Total	326	100,0	22**	100,0	304	100,0

*) Excluding employees in 6 organizations of specialized agricultural services

**) Difference of 1 expert is the IT specialist

Source: Calculation of the author based on documentation of the Republic agricultural service

The highest share within the structure of employees are agricultural experts 65,9%. More than ¼ of all employees are administration approx. 16% and12,3% others.

Organizational solutions

There is a need for investment into development of institutions needed to build capacities as well as institutional support which can provide maintenance of services.

Investment into education of farmers is necessary, which should be developed on principles of ownership by the farmer community, training which would satisfy the needs and development of the training program. Financial procedure can be powerful means focused on orientation towards needs. General framework in regard to financing of extension services offers guidelines on how to finance development of services in such a way that the beneficiaries manage the funds and pay for services according to agreements between mutual interested sides/parties.

Agricultural extension agents are of interest to beneficiaries of services if they are capable to offer practical solutions and new solutions for their problems, which impose the dynamics of cooperation between research institutions and extension services.

Through next three models it is possible to present organizational solutions of agricultural extension services in countries in transition and ways of financing:

1. Extension service based on government choice of financing which is present in countries (Romania, Bulgaria, Croatia, and Poland) where low capacity family holdings, farms are predominant.
2. Extension service consisting of private consultants. This concept of extension service is present in Hungary, Estonia, Slovakia and Czech Republic. This extension service is functioning in the following way: the government is not providing to farmers this type of service, but through application of different mechanisms it supports the use of extension services. So, consultant services are directed to market economy, but the government is still financially supporting economical and other incentives to farmers to use such services.
3. Government service collecting money from the private sector. In this concept, agricultural extension service exists within department of certain competent ministry and they as departments have the right to charge farmers for certain services (Lithuania and Latvia).

In our conditions of economy the potential model of organization of extension service would consist of three components:

1. Extension national centre for agriculture founded within the Ministry of Agriculture, Forestry and Water Management of Republic of Serbia, financed by the state with centralized functions.
2. Networks of regional services as agricultural and veterinary institutes, agricultural departments/ bureaus, agricultural and veterinary stations, all over Serbia.
3. Service beneficiaries and management in family holdings, specialized agricultural cooperatives and other food producers.

Constant dynamics of social-economical relations imposes solution in practice which would mean presence of commercial extensions services which provide for financial compensation to profitable agricultural holdings high quality services (D. Živković, R. Tomić, P. Munćan, S. Jelić).

In spite of high contribution of agricultural production in national product of Serbia, the decrease

of the contribution of competent ministry in the budget of Republic of Serbia is obvious/apparent (from 8,6% in 1996. to 3,6 in 2002.) as well as share of agricultural extension service in the ministry budget (from 2,50 in 1994. to 1,14% in 2001).

Agricultural extension service is partially financed by the competent ministry (107 million RSD in 2002.), and partially by the Provincial Secretariat for Agriculture, Water management and Forestry (80 million RSD in 2007.).

Additional means derive from agricultural activities and fees for services provided to independent agricultural producers.

It can be concluded that financial position of agricultural extension service in Serbia is not satisfactory which indicates inadequate relation of the competent ministry to this very important part of the institutional infrastructure in our agriculture.

At the end it should be pointed out that this service should be based on achievements and accomplishments of science, with complete division of scientific and expert activities, it has to be adjusted to objectives, using foreign experiences, critical and creative approach with provided continuity on long term basis with unique organizational models.

Conclusion

Agricultural extension service in Serbia is indispensable for providing scientific-expert services to agricultural producers. Historical path of its development in the world and in our country changed over time. Predominance of large number of small capacity family holdings, farms indicates the need for providing of services by this extension service. Diffusion of extensions forms is mutual characteristic of agricultural extension work all over the world.

Mutual interests determine the organizational and economical correlation between the state, producers, processors and extension service. Types of extension services have been pointed out depending on the concept and main tasks of extension service, also scope of their activities and tasks, education of agricultural producers, work methods, human resources, organizational solutions and financing of extension service in agriculture.

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MIGRATION AND HUMAN CAPITAL IN ITALIAN AGRICULTURAL LABOUR MARKET: A CASE STUDY ANALYSIS[1]

Rino Ghelfi[2], Sergio Rivaroli

Abstract

During the last years Italy, a country characterized by a long history of emigration, has seen a quickly growth of the phenomenon of immigration. Our Nation seems to be a "docking point" for new and substantial flow of immigrants mainly from Eastern Europe looking for new work opportunities. The profile of these people is usually characterized by high level of education as well as flexibility and adaptability. For the national economy in general, and for the agricultural sector in particular, this new migration flows represent an effective answer to the aversion for the agricultural job expressed by many potential autochthon workers.

Which are the characteristics of extra-community agricultural labour? Which are the characteristics of migration flows linked to the agricultural labour in three provinces of one of the main agricultural regions in Italy?

Based on National Institute of Welfare information's (INPS), the research underlines the diversification of this phenomenon among Italian regions as well as its dynamism. In Italy, during the last five years, the proportions of foreign agricultural workers increased up to 50%, and peaked in four Italian regions: Friuli Venezia Giulia, Campania, Piemonte and Emilia-Romagna. In Emilia-Romagna, in particular, immigrants represent almost a quarter of total agricultural workers and most of them aged less than forty years. The analysis of information about labour market in the agricultural sector in some Emilia-Romagna provinces shows that immigrants are concentrated in few farms. Farmer prefers to engage homogeneous ethnic groups to assure cultural affinity among the employees. In the local agricultural labour market the immigrants coming from Eastern Europe, in particular from Poland and Romania, are aged between 22 and 36 years, are unemployed in their country, they have a driving license and a good knowledge of Italian and English language.

Key words (JEL Classification): Agricultural Labour Markets (J43), Immigrant Workers (J61), Human Capital, Skills (J24)

Introduction

The metaphor of "useful invaders" (Ambrosini, 1999) accurately sums up society's attitude towards immigrants. Business leaders are increasingly accustomed to regarding immigrants as a vital resource for the local economy, as they constitute a predominantly young workforce with a good level of education and a flexible, adaptable attitude, even towards the least desirable and least stable jobs, of the kind that indigenous workers often refuse. At the same time, society at large expresses concern about the influx of immigrants, because their willingness to take on any work casts them in the role of "invaders", threatening to take away jobs from the indigenous population. The management of immigration and the desire to institute a lean, responsive system

1 This paper is the result of a strict collaboration among the authors, and the analysis was jointly designed and implemented.

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of recruiting migrant workers thus constitute a dilemma for policy-makers, who find themselves caught between opposing and not readily reconciled forces.

As in many European countries, immigration in Italy has seen increasing growth in recent decades. While the number of residence permits issued at the end of the 1980s stood at over 300,000 (Venturini et al, 2004, 3-4), by 2007 it had reached almost 2.5 million, equating to 4% of the population. In the decade from 1998 to 2007 alone, according to official statistics, the number of foreigners to whom residence permits were granted rose by almost 1.4 million, at an annual rate of approximately 11%. Of the various routes of access, employment, controlled by the issue of annual quotas and governed by specific decrees, was found – together with family reunification – to be the main reason for granting residence permits. In 2007, jobs carrying contracts of employment accounted for 61% of residence permits issued. Whereas in the 1990s the largest number of immigrants to whom residence permits were issued originated from Africa, in recent years their number has been exceeded by that of immigrants from Eastern Europe. The percentage of resident immigrants working in agriculture is particularly high in the south and islands (over 16%). In the central and northern regions of Italy, by contrast, the foreign workforce is absorbed chiefly by the secondary sector.

In Italy, as in the majority of Mediterranean countries, the foreigners working in agriculture now constitute an essential part of the workforce, capable of filling the shortfall in labour suffered by the agricultural production system and not fully met by the local pool of labour. In this respect, recourse to the use of immigrant seasonal workers is an effective response to the tensions that characterise the labour market in various regions of Italy, and serves as a strategic lever in the competitiveness of the primary sector (Ghelfi et al., 2005). The use of agricultural labour from outside the European Union is relatively diversified in Italy and is marked by a high degree of dynamism. While there was a progressive increase in recourse to extra-EU labour until 2002, the five subsequent years saw a progressive fall, from almost 120,000 employees from outside the European Union in 2003, to just under 85,000 in 2007. Remaining within the context of Italy, in the five-year period examined the share of extra-EU employees in agriculture rose from almost 8% in 2000 to 11% in 2004, before returning gradually to the original figures in 2007. If we focus exclusively on the Emilia-Romagna region, in which rates of migration for the purposes of agricultural work are especially high, we find that the percentage of extra-EU employees stands significantly above 22%, thus substantiating the structural nature of the phenomenon. The extent and the structural nature of the phenomenon is also borne out by an analysis of performance in terms of working days. The number of days worked by migrants is comparable to the number worked by EU personnel, and also manifests a faster rate of growth. The analysis shows that foreigners legally employed in agriculture are generally aged between 22 and 49 years. Within this range, the highest concentration of extra-EU employees is to be found in the 30-39 age brackets.

In order to highlight the distinctive characteristics of the supply and demand of foreign labour, we shall present the results of a direct survey conducted in three provinces particularly subject to the phenomenon: Ferrara, Ravenna and Forlì-Cesena. For this purpose, we shall use the results of a direct survey conducted at the Ravenna Police Headquarters on a group of extra-EU immigrants, who arrived in Italy after receiving authorisation to undertake seasonal work in agriculture.

Materials and methods

For the purpose of analysing the characteristics of employers, workers and jobs undertaken, a direct survey was conducted at the Provincial Labour Office and the Provincial Social Security Office of Ferrara, Ravenna and Forlì-Cesena. The use of the Lorentz curve as a tool for examining the distribution of seasonal agricultural workers taken on by the employers involved, brought to

light a number of interesting profiles of the phenomenon under investigation. The survey was completed with a questionnaire aimed at determining the characteristics of extra-EU agricultural workers. The questionnaire was first tested and then distributed to 135 immigrant workers contacted at the Police Headquarters of Ravenna and the Commissariats of Lugo and Faenza, in the period July to September 2005.

Results

Analysis of seasonal work permits issued by the Provincial Labour Office of the provinces of Ferrara, Ravenna and Forlì-Cesena reveals that, in the period 2003-04, the number of permits issued in the first two provinces remained broadly stable, while in the province of Forlì-Cesena, the total number fell by 31%. The same trend was found to apply to the number of employers requesting seasonal workers. Excluding the province of Forlì-Cesena, in the two-year period under examination, there was a rise in the number of agricultural businesses that had recourse to immigrants to meet their labour requirements (Table 1). This appears to be a first sign of the difficulty experienced by agricultural businesses in sourcing indigenous labour to perform their core tasks. The total number of work contracts and workers involved, and the data relating to rights of precedence, highlight the extent and structural nature of the phenomenon: in the province of Ravenna, in fact, no less than 49% of the workers were employed by the same companies in both the years considered. An analysis of distribution by quartiles yields a more detailed breakdown of the supply of agricultural work. The median value for workers employed in agricultural businesses is fewer than five employees in all three provinces and, taking account of the third quartile, does not exceed 11 units. This finding points to a considerable concentration of the majority of workers within a few medium and large enterprises, or in cooperative companies which employ seasonal staff not only for work in the fields but also for duties connected with the initial treatment of the raw material. A look at the Lorentz curve (Figure 1) shows that, in all three provinces, more than 60% of workers are concentrated in little more than 20% of companies. In view of the high concentration of workers absorbed by 20% of employers, we decided to divide the sample into two groups: the first corresponds to 80% of employers (Group 1), while the second is made up of the remaining 20% (Group 2). The first group is made up of relatively small farms, with an average area not exceeding 53 hectares. The second group, in which the majority of immigrant agricultural workers are employed, is made up of large farms, with an average area, in the province of Ravenna, approaching 159 hectares (Table 2). Furthermore, in the province of Ravenna, the average number of days per worker is the highest of the provinces surveyed, with a total of almost 65 days per head. The analysis of the structural characteristics of the farms does not reveal any significant differences between the production profiles of each group. In particular, it should be noted that the sample analysed consists chiefly of farms with an intensive approach to production, in which the percentage of land given over to the cultivation of fruit and vegetables exceeds 60% of the total (Table 3). In the majority of cases, employers show a preference for employing groups of homogeneous ethnic origin. As well as simplifying bureaucratic procedures, this preference appears to derive from a desire to form culturally compatible groups. In the majority of cases, the immigrants originate from Eastern Europe, with a marked prevalence from Poland and Romania, and are aged between 22 and 36 years. Excluding the province of Ferrara, where approximately 50% of permits have duration of less than 4 months, the period of validity of work permits tends to approach the maximum allowed under the relevant legislation. In line with the findings of other studies (Ambrosini, 1999; Ambrosini, 2001; Allasino, 2004), the questionnaire-based survey revealed that the level of education of the immigrants involved is medium/high, to the extent that 75% hold a high-school diploma and 6% are graduates (Table 4). Their knowledge of Italian is normally average and they speak at least one additional language fluently, predominantly English. They generally hold at least a level B driving licence (72.5%) and are often capable of driving heavy vehicles. The validity of their residence permits ranges from 7 to 9 months, and while the women are chiefly employed for warehouse work, the men are normally assigned to more physically demanding agricultural tasks such as fruit-picking.

Final remarks

Over two million migrants currently reside in Italy with a valid residence permit for working under a contract of employment. In agriculture in particular, the presence of foreign workers has assumed highly significant proportions. In various areas of production, the share of foreign workers now exceeds 25% of the total workforce. The people involved are generally young and qualified, with previous work experience, and offer the highest levels of flexibility and willingness to work. Despite this, companies which intend to employ foreign seasonal workers are faced with an extremely complex bureaucratic process, whose throughput times are sometimes not compatible with the speed of response required by agricultural production systems. Complexity and inefficiency thus oblige businesses to incur substantial transaction costs, and result in less than optimum use of resources. On the one hand, the high number of applications for revocation of work permits shows that, in addition to factors relating to the economic climate, employers protect their interests by applying for higher numbers of workers than they expect to need, with a view to then cancelling accepted applications on the basis of actual requirements. On the other, the duration of service of workers does not generally exceed 25% of the maximum duration allowed by their residence permit. A sign of the complexity of the bureaucratic process for the employment and mobility of foreign workers also finds expression in the changes observed in migratory flows. The "ethnicisation" of the labour market does not appear to be due to real specialisation or cultural factors or the tradition of migrants. Various opinions reach agreement on the notion that the concentration of migrant workers in certain sectors of production and certain niches of work is predominantly influenced by Italy's procedures for placing migrant workers in work (Ambrosini, 2001; Allasino et al, 2004). In this respect, the social networks created between foreign workers already present in Italy and the potential migrants still in their country of origin, constitute a plausible hypothesis for explaining the characterisation of foreign labour, the evolution of migratory flows and the integration of immigrants into the host society (Portes et al., 1989). One question which remains to be answered many years since it was first posed, and which finds echoes in various contributions on the subject of immigration (Grossman, 1982; Card, 2005), relates to the impact of these new migratory flows on the opportunities which the local agricultural labour market could potentially offer indigenous workers. While for some authors, new migrants constitute the main competitors of the less qualified indigenous workforce (Borjas et al., 1997; Borjas, 2003), for others, a natural and "peaceful" coexistence between the local and foreign workforce appears plausible, in a scenario which sees the two groups operating in conjunction rather than competition with each other (Reyneri, 1996; Ambrosini, 2001; Linton, 2002).

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Table 1 - Seasonal migration in agriculture: employers, permits, work contracts, workers and working days

	Ferrara			Ravenna			Forlì-Cesena		
	2003	**2004**	**Var%**	**2003**	**2004**	**Var%**	**2003**	**2004**	**Var%**
Employers	134	145	*8.2*	310	316	*1.9*	235	141	*-40.0*
Permits	1,398	1,406	*0.6*	1,429	1,383	*-3.2*	746	514	*-31.1*
- positive result	1,037	1,202	*15.9*	1,177	1,383	*17.5*	666	437	*-34.4*
- extension	75	59	*-21.3*	0	0	*0.0*	2	1	*-50.0*
- joint	0	0	*0.0*	242	0	*-100.0*	69	68	*-1.4*
- revocation	286	145	*-49.3*	10	0	*-100.0*	9	8	*-11.1*
Work contracts (a)	1,112	1,261	*13.4*	1,419	1,383	*-2.5*	737	506	*-31.3*
Workers (b)	1,042	1,187	*13.9*	1,282	1,131	*-11.8*	702	466	*-33.6*
- right of precedence (c) (%)		25.2			27.3			49.1	
Working days	37,751	44,387	*17.6*	85,526	80,722	*-5.6*	25,805	19,191	*-25.6*
- by employer	282	306	*8.7*	276	255	*-7.4*	110	136	*23.9*
- by worker	36	37	*3.2*	67	71	*7.0*	37	41	*12.0*
Distribution by percentile of employers of the number of workers									
Min	1	1		1	1		1	1	
25	2	2		1	1		1	1	
50	4	5	*	2	2	*	1	1	*
75	11	9		3	3		2	3	
Max	145	143		296	181		141	153	

Source: Own elaboration based on DPL information

Note: (a) The work contracts represent the practices authorized minus the revocations presented by the employers; (b) A worker can work for one or more employers, for this opportunity the real number of workers is less than the number of work contracts; (c) A worker that has worked in a firm the preceding year acquires a right of precedence for the year in progress.

Table 2 - Segmentation of the sample of employers orderly by increasing number of employees (year 2004)

	Employers (#)	Surface (hectare)		Work contracts		Days INPS	
		Total	Average by firm	Total	%	Total	By work contracts
Ferrara							
Cluster 1	112	5,951.25	53.14	497	39.4	10,702	22
Cluster 2	28	3,921.14	140.04	764	60.6	33,685	44
Total	140	9,872.39	70.52	1,261	100.0	44,387	35
Ravenna							
Cluster 1	252	7,568.67	30.03	431	31.2	19,316	45
Cluster 2	64	10,198.95	159.36	952	68.8	61,406	65
Total	316	17,767.62	56.23	1,383	100.0	80,722	58
							Forlì-Cesena
Cluster 1	112	5,027.92	44.89	155	30.6	6,595	43
Cluster 2	29	2,003.05	69.07	351	69.4	12,596	36
Total	141	7,030.97	49.87	506	100.0	19,191	38

Source: Own elaboration based on DPL information

Table 3 - Structural characteristics of sample (year 2004; % of employers)

	Ferrara		Ravenna		Forlì-Cesena	
	Cluster 1 (n.112)	**Cluster 2** (n.28)	**Cluster 1** (n.252)	**Cluster 2** (n.64)	**Cluster 1** (n.112)	**Cluster 2** (n.29)
Extensive	17.9	7.1	7.9	6.3	21.4	27.6
Intensive	50.0	64.3	65.5	64.1	43.8	41.4
Mixed	22.3	17.9	23.4	25.0	19.6	13.8
Without surface	9.8	10.7	3.2	4.7	15.2	17.2
Total	100.0	100.0	100.0	100.0	100.0	100.0

Source: Own elaboration based on INPS information

Table 4 - Characteristics of immigrant agricultural workers in Ravenna Province (value %; year 2005; n.135)

Age (number of interviewed)			
Age	**F**	**M**	**M+F**
19-28	14	33	47
29-38	13	35	48
39-48	11	14	25
49-58	4	9	13
ND	2	0	2
Total	44	91	135

Nation of origin			
	F	**M**	**M+F**
Poland	68,2	30,8	43,0
Romania	27,3	40,7	36,3
Albania	4,5	28,6	20,7
Total	100,0	100,0	100,0

Employment situation of immigrant agricultural workers in their country			
	F	**M**	**M+F**
Unemployed	86,4	90,1	88,9
Employed	13,6	9,9	11,1
Total	100,0	100,0	100,0

Instruction			
	F	**M**	**M+F**
Professional	4,5	4,4	4,4
Superior	88,6	68,1	74,8
Degree	2,3	7,7	5,9
ND	4,5	19,8	14,8
Total	100,0	100,0	100,0

Level of knowledge of Italian language			
	F	M	M+F
Mediocre	43,2	42,9	43,0
Not so good	25,0	44,0	37,8
Good	4,5	0,0	1,5
ND	27,3	13,2	17,8
Total	100,0	100,0	100,0

Knowledge other languages more than Italian	
English	41,7
Greek	26,7
German	13,3
Others	18,3
Total	100,00

Driving licence (n.80)			
Type	**F**	**M**	**M+F**
A	0,0	4,8	3,8
a-b	100,0	65,1	72,5
a-b-c	0,0	12,7	10,0
a-b-c-d	0,0	1,6	1,3
a-b-c-d-e	0,0	14,3	11,3
a-b-c-d-e-f	0,0	1,6	1,3
Total	100,0	100,0	100,0

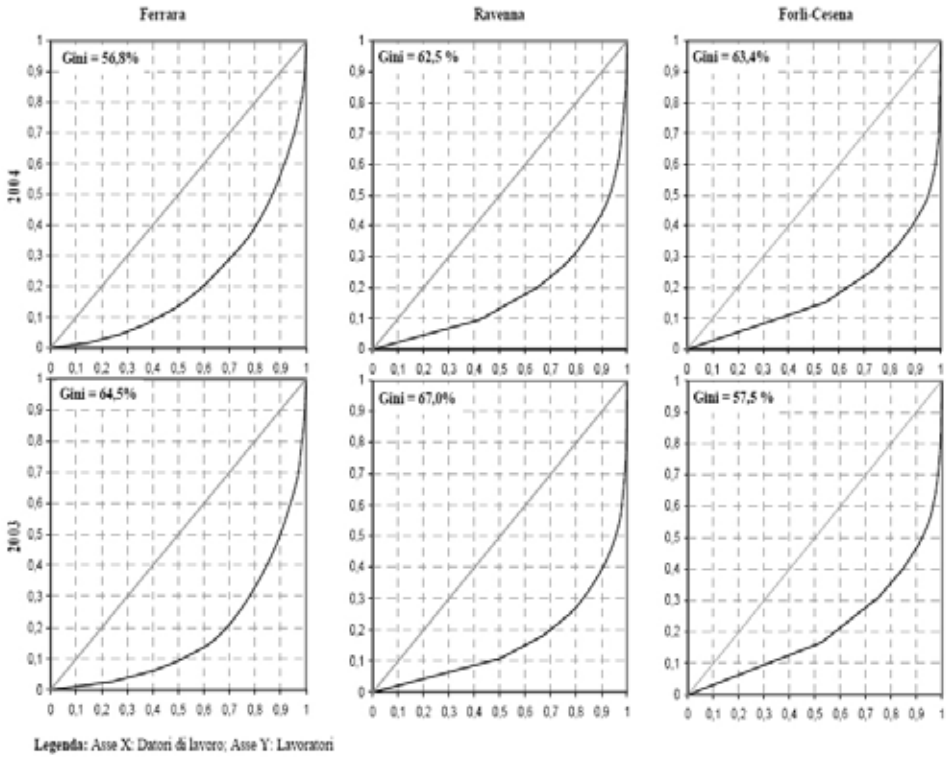
Availability to work [(a)]			
	F	**M**	**M+F**
No	61,4	25,3	37,0
Yes	38,6	74,7	63,0
Total	100,0	100,0	100,0

Source: Own elaboration based on INPS information

Legenda: F=female; M=male; M+F= male and female.

Note: (a) Availability to extend the working period after the actual activity.

Figure 1 - Agricultural seasonal migration: degree of concentration of agricultural workers migrants



Source: Own elaboration based on DPL information

MULTIFUNCTIONAL AGRICULTURE IN BULGARIA - OPPORTUNITIES AND PROSPECTS

Julia Doitchinova[1], Ivan Kanchev, Albena Miteva

Abstract

The purpose of the paper is to analyze and to assess the status of the multifunctional agriculture in Bulgaria and on the basis of the attitudes of the agricultural producers to develop such activity to suggest trends for strengthening their adaptation to CAP conditions.

The paper presents the main results from a scientific research of a team from the University of National and World Economy, Department "Economy of Natural Resources", Agribusiness Section - Sofia, Bulgaria (2006-2007).

Key words: multifunctional agriculture, multifunctional agricultural holding

The concept of multifunctional agriculture emerged in the last decade of the twentieth century in developed countries where the economic importance of agriculture was negligible, and the community was increasingly concerned more with the quality of consumed food and the surrounding environment. In this concept developed in a period of political change is justified the need for continuing support of the sector in terms of liberalization of world trade. In practice, the concept of multifunctionality confirms the positive effects and impacts of agricultural production.

In 2005 the multifunctional agricultural holdings are almost 24% of the holdings with size higher than 1 ESU and 63 2% of the registered agricultural producers. These data, as well as the results from different surveys depict the large interest of Bulgarian producers to the linked with agriculture and rural regions activities.

The purpose of the paper is to analyze and to assess the status of the multifunctional agriculture in Bulgaria and on the basis of the attitudes of the agricultural producers to develop such activity to suggest trends for strengthening their adaptation to CAP conditions.

Methodological basis

In scientific literature there is no common understanding of the nature of multifunctionality of agriculture. Even the most frequently quoted in the literature working definition of the Organization for Economic Cooperation and Development (2001) does not reflect the nature of the phenomenon, but rather only its two main characteristics. According to it, "the key elements of multifunctionality are a lot of market and outcomes that are jointly produced in agriculture", as well as" the fact that some of the non-market effects obtain the characteristics of public goods with the result that markets for these goods do not exist or function poorly "(OECD, 2001).

Among European researchers more and more widespread support finds the positive approach towards the issues of multifunctionality. It is bound and displayed from the characteristics of the agricultural production process and its results. Together with the production of market

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and non-market public goods, the subject of research interest are the impacts of agricultural activity. Most authors do not distinguish the effects of agricultural production by produced by it related products and public goods. Even researchers who have recognized this distinction accept that due to the complex nature of the impacts of agriculture that line is non-clear (Mollard, 2003).

Agriculture multifunctionality is interpreted through the functions that are immanent to the industry - the production function, food security, social function, employment in the territory and the impact of environment. Only the latter is among the widespread aspects of the analysis of the multi-directional impact of agriculture on environment.

Some authors (Potter, Tilzey, 2005) associate multifunctionality concept with the social welfare and the need for diversification of the additional functions of agriculture such as biodiversity, landscape, cultural heritage and others. For other researchers (Tilzey, 2003) multifunctional agriculture is a concept that encompasses many physical benefits and services to the agricultural system, which have similar effects on humans and the surrounding environment.

Multifunctional farm is defined as an organization in which "multifunctionality is a structural principle, network of rules, which generate short-term and long-term choices" (Belletti, Brunori, Marescotti and Rossi 2002). It is asserted that the multifunctionality of the agricultural productive process is included in the entrepreneurial values and knowledge. On agricultural holding level the entrepreneur should work on different ways, combining resources, knowledge and other in order to obtain the multifunctional effects, generated in the productive process realized in the holding.

On the basis of Van der Ploeg model of the farming are reviewed the different activities which expand holding participation in the agro-industrial network and diversify the executed activities in local context. They are used for interpretation of the differences between the conventional and multifunctional agricultural holding.

Activities that underpin the expansion of the farm by diversifying its activities as a rule create possibilities to use available in farm landscape and resources to increase employment of the rural population, to increase and stabilize income of farm households.

On the basis of the model of multifunctional holding some researchers base the diverse effects that it creates. These effects occur both for the holding and for the members of the household of the farmer as well as for the surrounding market, environmental, social and cultural environment, i.e. for the surrounding farm area.

While the conventional farm was motivated solely by the market value of the results, the multifunctional seek a combination of both types of results. However some non-market outcomes, although being realized at individual level (on the farm) can be obtained only by organized joint efforts of the farmers in a given territory.

Methodical research frame

Farm is presented by its production specialization, size, organizational status and various combinations of ownership of used production factors. Combination of these characteristics determines the unequal opportunities for the development of various activities which can be interpreted as potential factors for the development.

The farmer with his education, experience and age style is the basis for the formation of other attitude towards the incentives for preserving the environment, agricultural policy and more.

Rural areas for the purpose of the study are interpreted as the immediate surroundings of the farm, which to some extent affect the development and capacity to adapt to changes in the external environment due to general and national agricultural policies. For these reasons, was given preference to different rural areas, which at the same time are typical rural areas in the country with various traditional production specializations. Was taken into consideration the distance from large towns; variety of size of agricultural holdings; variety of landscape; variety of towns and villages.

Development of agriculture-related activities and the use of farm production resources for other purposes presuppose the involvement of farmers in various professional organizations with business and non-business purposes. They increase the effectiveness and efficiency of the activity of the individual farm. Examples in this respect are the providers of various tourist services in the territory of a municipality, associations of craftsmen and other.

To assess the status and opportunities for development of multifunctional holding are used the inquiry method combined with structured interview. Are ground questions for assessment of the attitudes of the agricultural producers to the multifunctional activity.

The investigation is carried out on two levels:

Regional level - 5 municipalities from which 4 are classified as rural regions. Object of research are the opinions and evaluation of experts working in the regional offices "Agriculture and forestry" and of specialists in the area of agrarian business from the municipalities.

Agricultural holding level - 108 agricultural holdings with multifunctional activity or expressed interest to its future development.

Research results

The results show substantial differences in the evaluation of the experts and agricultural producers per municipalities, between municipalities with small and big towns, per holdings with different productive specialization. The biggest differences are in terms of reasons of farmers not to wish to be registered and thus to not have the possibility to use the different measures of the CAP. While experts of intensive areas associated it with the low amount of own farmland and low single payment per hectare, in the cereal regions the experts do not agree with this opinion. Explanations of the experts are associated with the size and cost structure of the most widely grown crops. In areas with arable crops the single payment per hectare is assessed as low (in fact it is about 25-35% of direct production costs in 2007), while for many other crops (vegetables, perennial crops, some technical, etc.) its relative share is insignificant (2-5%). Another explanation are the existing differences in the average amount of own land in both areas.

To assess the relations between experts' evaluations is applied correlative analysis and is used Spirman coefficient as well as regressive model.

Highest value (0.856) have correlation coefficients of the assessment of farmers awareness and of the assessment that the small number of registered farmers due to the low rate of payment for one hectare. Further is the relationship between awareness and the tendency of manufacturers to invest in machinery and technology to increase the efficiency of their activities (0.764). With similar

value (0.766) is the coefficient of correlation between the adoption of multifunctional model of agriculture by farmers and the tendency of farmers to diversify their business holdings. It is the basis of the need to promote the European experience and capabilities, which are provided by various measures of the CAP.

Particularly high (0.818) is Spirman coefficient of the tendency for manufacturers to focus on processing agricultural products and positive assessment of the impact of agriculture on environmental quality.

The following general conclusions are made:

- Higher is the expectation for development of the multifunctional model of agriculture in the regions with intensive crop production, close to big cities in comparison to the typical agricultural regions close to relatively small towns;
- The higher degree of knowledge and information and the acceptance of the multifunctional model as desired aim for the development are preconditions for successful adaptation of producers to CAP conditions;

Are assessed the expected changes in the productive specialization of the holdings and the intentions of agricultural producers to develop variable multifunctional activities as well as to become members in different collective organizations - of agricultural producers, ecological organizations and other NGO structures.

The survey study of 108 farms conducted during the summer of 2007 showed an increased interest of their owners to multifunctional activity.

In determining the objects of research, the specialists in the municipal service "Agriculture and Forests" in the five municipalities used data from the census of agricultural holdings for 2003.

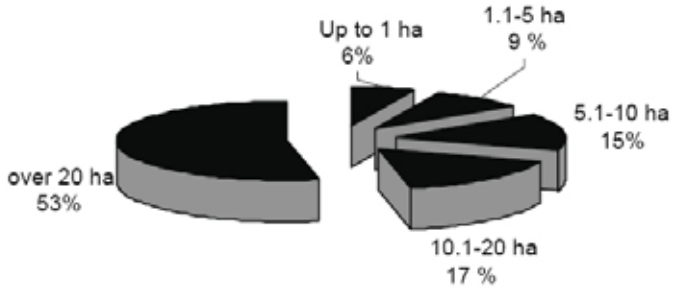
In the survey are included farms with different specialization and size. Most significant is the presence of specialized in cultivation of arable crop farms in the municipalities of Silistra and Tutrakan - 30 and 35 percent, followed by specializing in perennial plants farms (25% in September and Brezovo municipalities and 20 percent in the Rhodopi municipality) and mixed plant-breeding farms (between 25% in the municipality in September and between 15% and 20% in other municipalities).

In the structure of the studied farms dominate these in size of the land over 20 hectares (53%), followed by those between 10 and 20 hectares (17%), (Figure 1). Explanation for these high rates is the criteria for selection of objects of interest, including farms with multifunctional activity and producer's actively seeking information about changing business environment.

Of them own land fully or up to 80 percent of the land cultivates 32% of the respondents. Own and leased land up to 50% of the utilized agricultural area are managed by 11% of farms and leased land by over half of the utilized land – 57%.

In the farms involved in livestock are kept between one and three animal species. These include 48% of all surveyed sites. Most numerous are the farms breeding one type of animal. They are 23% of all farms and almost half of the livestock farms. Most livestock farm are interviewed in Brezovo Municipality (65%) and least is the number of interviewed farmers in Septemvri (40%).

Figure 1. Structure of agricultural holdings



Regarding the legal status in the study were included 71 family farms of individuals, 23 registered as sole traders and 11 companies. In most of them (10) the partners are relatives of family members. The only exception is a limited liability company in the municipality of Silistra, which members are distant relatives and former colleagues.

In 45 percent of the farms with multifunctional activity the relative share of these activities is significant, in 38% is negligible (up to 10 percent of farm income) and is prevalent in 16% (Table 1). In most municipalities, farms with a predominant and significant income from non-agricultural activities were noticed in two municipalities near the bigger cities - Rhodopi and Silistra, followed by Brezovo and Septemvri.

Among the holdings engaged with multifunctional activity the biggest number are those which provide mechanized services. These are provided by 29% of all farms. On the next place are those which are engaged with the direct sale of agricultural products (45.45%) and others. Smallest it the number of the engaged with processing of agricultural non-food products and aquaculture.

Table 1 - Distribution of farms according to the relative share of non-agricultural activities in household income

Municipalities	Up to 10 %	11 % - 50 %)	(over 50 %)	No income from agr. activities
Silistra	15	30	15	40
Tutrakan	35	10	5	50
Brezovo	20	20	10	50
Rhodopi	5	40	15	40
Septemvri.	30	25	0	45
Total	21	25	9	45

Overall the majority of farmers have opted to develop more than one multifunctional activity. Average for a farm are developed 2.1 activities and the differences between municipalities range from 1.6 in Tutrakan to 2.12 in Silistra and Rodopi.

The activity of the agricultural producers towards the use of CAP measures is low. Evidence for this is the following data:

- Executed variable business projects - 23% of interviewed,
- Participation in ecological projects is only 8%.
- Participation in collective organizations - 28%

Subject of special interest in the inquiry were the intentions of farmers to adapt to the new conditions of EU membership.

CAP will influence the development of the non-agricultural activities according to 63% of the interviewed.

Participation in collective organizations as a whole is supported by 89% of the interviewed but 41% put a condition for a significant income increase (over 30%) and 27% - to have confidence in the managerial body. Only 3% do not link their participation in collective organizations with a considerable income change.

Participation in ecological projects is supported by 90% of the interviewed. Around every third of them (32%) do not link its participation in similar activity with income change, whereas 22% will participate if their incomes increase with 30 percent.

Agricultural producers order the reasons for their interest in multifunctional activity as per following way:

1. Higher income - 93% of interviewed;
2. Better use of own resources - 45% of interviewed;
3. More evenly received income - 23% of interviewed;
4. Additional activity for household members - 35% of interviewed;
5. Diversification of labour occupancy - 38% of interviewed;
6. Provision of new products and services to local inhabitants - 18%;
7. Preservation of environment of interviewed - 22% of interviewed;
8. Higher prestige of the put in work labour in comparison to the agricultural labour of interviewed - 26%.

The responses are higher number, because every farmer gave up to 3 reasons.

It is noticed a linkage between the desire to develop multifunctional activities and the age and educational level of producers. Highest is the relative share of the people desiring to develop such activities in the two groups of the younger farmers - 100% of the farmers from the age group (35 to 44 years) and 93,8% of the interviewed of the farmers of age between 25 to 34.

Data from Table 2 show higher degree of desire for multifunctional activities with the farmers with higher level of education, because all with Bachelor and Master

Degrees of education are prone to be engaged with different activities supplementing their income. At the same time 37,5% of those with primary education and every tenth of the people with secondary education and with specialist degree do not have desire to develop linked with agriculture activities.

Using clusters analysis with the method of K-medium (K-Means Cluster), farm owners and their 4 groups were formed with 25 signs/indicators (Table 3). Clusters include different number of farms with similar combinations between the characteristics of farms, farm owner's styles and assessing

their intentions to develop multifunctional activity and the farmers to use various options due to our country's membership in the European Union. The biggest small farms are included in the first group (19%). In cluster A are grouped mostly mixed farms in which production takes place at a relatively lower level of intensity. Farmers have a relatively high level of education and highlighted interest in environmental practices and innovations.

Table 2 - Distribution of agricultural producers according to level of education and intentions for development of multifunctional activities

Level of education	Will not develop	Expansion (diversification)	Processing and other activities in the food chain	Total
Primary	37,5	12,5	50	100
Secondary	11,1	27,8	61,1	100
Secondary Technical	12,1	42,4	45,5	100
Specialist	12,5	37,5	50	100
Bachelor		16,7	83,3	100
Master		44,4	55,6	100
Total	10	36	54	100

In cluster B are referred specialized farms, with relatively less educated owners who do not develop themselves and have relatively limited intentions to develop non-agricultural activities. Compared with other groups in group B were included farmers who can be referred to the so-called traditional farmers.

Most numerous are farms in cluster C (31%). In it are grouped holdings with increased interest in multifunctional activity and at the same time developing agricultural production at a relatively high level of intensity, reflected in their final production results. Here are included farmers with increased interest in the creation of producer organizations and others.

Cluster D includes 23 percent of the farms that are managed by highly educated owners in the field of agricultural science with relatively limited production experience. Farmers have desire to develop and combine farming with other activities. They organize mainly specialized farms with high intensity of production, using good practice.

Producers from cluster C and D have higher potential and attitudes for development of multifunctional activity, because they combine a desire for multifunctional activity with high intensity of agricultural production and farming styles higher level of adaptation to CAP conditions.

Conclusions

In the last part are developed trends for speeding the development of multifunctional agricultural holdings. They focus on the conditions and preconditions for obtaining vast community support and regulations in the following main directions:

- Building of Community Councils and the needed for them institutional measures;
- Elaboration of regulatory and legislative basis for their implementation;

- Implementation of tailored economic instruments for influence and speed of multifunctional producers' activity.

Are assessed the expected changes in the productive specialization of the holdings and the intentions of agricultural producers to develop variable multifunctional activities as well as to become members in different collective organizations – of agricultural producers, ecological organizations and other NGO structures.

The legislative basis and linked with it regulators are directed towards concrete areas for diversification of rural regions economy in the following directions:

- Development of service for rural tourism;
- Creation of preconditions for local crafts development;
- Expansion of activities linked with processing and direct sale of own production in the holding itself;
- Building of a social service for local population system;
- Production of energy from renewable sources.

Table 3 - Main characteristics of the groups using clusters centres

Groups of holdings	Features
Cluster A	Focused attention to the multifunctional activity Mixed farms Relatively low intensity of agricultural production Greater interest in non-agricultural activities Educated producers with relatively less experience in agriculture production Farming style, similar to the innovative Intentions to participate in environmental projects
Cluster B	Focused attention to agricultural production Specialized farms Low intensity farming Farmers with relatively low educational level Intentions to participate in environmental projects
Cluster C	Highlighted attention to multifunctional activities and high level of support for future development Specialized farms Greater interest in non-agricultural activities High level of intensity of agricultural production Farming style of multifunctional type Participation in collective organizations
Cluster D	Combining agricultural with non-agricultural activities Specialized farms High level of intensity of agricultural production Average longevity of production experience Highly educated owners Education related to agricultural sciences Farms that are registered as sole traders or trading company

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PROBLEMS IN THE EXTENSION WORK AND FARMERS' NEEDS IN SERBIA[1]

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Abstract

In the paper, the authors analyse problems in the extension work and farmers' needs on the basis of the empirical sociological survey that comprised attitudes of all the agricultural extension workers in Serbia. The survey has been conducted by the authors during 2008 in all of the extension offices in Serbia using the semi-structured questionnaire. The analysis reveals the regional specifics of the farmers' needs and the problems that the advisors face in daily work, as well. According to the survey results there are three types of problems that are mutually connected: 1. general crisis of the agricultural sector, 2. problems regarding characteristics of farm holdings and farmers population in Serbia and 3. problems that are related to extension organization. Farmers' needs analysis points to four dominant needs of farmers in Serbia: 1. farm management, 2. help in establishment of farmers' cooperatives, 3. plant protection and 4. information and advice regarding the agricultural policy.

Key words: agricultural extension, problems in extension work, farmers' needs

Introduction

Agricultural extension in Serbia is facing the essential reforms that have to be made. At the moment, Serbian Ministry of Agriculture, Forestry and Water Management is working on the Law on Agricultural Services and the Strategy of Development of Agricultural Extension. During the last several years reforms of extension service have had very slow pace and this may be the consequence of the inertness of the government to start dealing with the crucial reforms in the extension sector, but also the consequence of the extension services themselves to introduce reforms in their own work (see Janković and Čikić 2008). Having in mind the importance of participation of extension staff in the future reforms, the authors of this paper have conducted an empirical survey (by using semi-structured questionnaires) on the role of agricultural stations in agricultural extension in Serbia (Province of Vojvodina and Central Serbia), comprising the attitudes of all of the extension staff in all agricultural extension offices (agricultural stations) in Serbia (Vojvodina: 13 agricultural stations with 72 advisors; Central Serbia 21 agricultural stations with 134 advisors). In the absence of such and similar

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research in Serbia, these results could be one of the elements for the creation of adequate policy in the agricultural extension, if, of course, the government is able to appreciate such analysis. In that sense, we believe that considering the extension staff's opinion on many issues regarding the reforms of "their" extension organization would be very motivating for them and might be the one of several conditions for success of the future reforms of Serbian extension. Regardless to all of the shortcomings in organization, extension programs, human resources and technical aspects of Serbian extension, the authors of this paper consider the human resources in Serbian extension as very important in agricultural development and development of family farms in Serbia. Due to low level of farmers' education, lack of information and knowledge regarding new technologies and market situation, agricultural extension is very important factor for future farm modernization in Serbia.

Extension service in Serbia is addressed to family farms and these services are free of charge for them. Other extension suppliers (private extension companies, NGO, etc) are almost non-existent. Within this broad target group the government aims most of extension activities to more commercial family farms (so-called "selected farms" – within the program period of three years) whose number in Vojvodina is approximately 3500 and in Central Serbia approximately 5000 farms (see Janković and Čikić 2008). Extension work includes mostly individual visits to these farms, but other types of communication and extension methods to these, but also to other (non selected) farms[5]. The authors' research of extension in Vojvodina shows that advisors have selected farmers with whom they have already had better communication and cooperation in the previous period (we assume that the same conclusion can be made for the advisors in Central Serbia). This point to certain homogeneity of the selected farms with respect to their interest for extension support. This actually confirms the well-known bias of advisors who prefer to work with farmers with whom the cooperation is easier, mostly better-off farmers, who initiate cooperation by themselves, who are more interested in extension support and who have more financial means to apply the advised technology or organization of farm production[6]. In Serbian context it is understandable that this target group is pretty small. But, in the concepts of state organized and financed extension, potential help to as many farmers as possible is important because the extension is the obligation of the state. It is "first because of its duty to create social justice and social equality and secondly, because an adequate supply of food and further development aims cannot be attained unless the mass of agricultural producers can be activated" (Albrecht et al. 1989: 37). According to this fact, one can expect neglecting of other farmer groups (usually small, less commercial and less interested in extension support), especially in Vojvodina where – compared to Central Serbia – the land and other resources are more in favour of intensive model of agricultural production[7].

5 Some data from the System of information in agricultural extension service of Vojvodina, that was created by the authors for the purpose of monitoring of extension activities for the Province Secretary of Agriculture, Water Management and Forestry, reveal that advisors in Vojvodina spend around 30% of their working hours engaging themselves with "non-selected" farms, as well. Besides farm visits that are mostly reserved for the selected farms, other farmers enjoy extension support through mass media, lectures, field days, phone, fax, mail and other types of extension communication (see Petrović 2007).

6 "In laymen's terms we could say that change agents, like most human beings, associated themselves most with those who were on the same wavelength, and with whom they got along best. In doing so, they also tended to become more familiar with the problems and issues faced by such farmers, leading to further efforts to cater for their needs, rather than for the needs of others" (Leeuwis and van den Ban 2004: 137)

7 Target group strategies are some of important issues in extension (see, van den Ban and Hawkins 1996: Albrecht et al. 1989; Leeuwis and van den Ban 2004; Rölling 1988) that are linked to the aims that government wants to achieve with a certain extension policy (see more, Brent and Adams 1999; Adams 2001).

Problems in extension work with farmers in Serbia

Based on a qualitative analysis of the advisors' opinion about the most important problems they face in everyday extension work with farmers, we may conclude that – according to the survey results – some regional differences in the context of problems in extension work do exist and that there are three types of problems that are mutually connected: 1. general crisis of the agricultural sector, 2. problems regarding characteristics of farm holdings and farmers population in Serbia and 3. problems that are related to extension organization.

According to the qualitative analysis, extension workers in Central Serbia more often emphasise problems that are mostly related to age structure of the farmers, traditional farming and small scale agriculture. This can be understood if we have in mind the average size and number of plots in Central Serbia[8] (5 plots, the average size of a plot 0.74 ha) compared to Vojvodina (3 plots, the average size of a plot 1.25 ha) (Bogdanov and Božić 2005: 96). Compared to Vojvodina, ageing process is more intensive in Central Serbia with significant share of the oldest members on the farms (over 65 years=24.3%), higher share of mixed farms and lower share of non-agricultural farms (Božović and Bogdanov 2005: 83). Also, in Central Serbia share of population on farm holdings with the lowest education is higher than in Vojvodina (Ibid. p. 85).

When asking advisors about the most important problems they face in everyday extension work with farmers, advisors in Vojvodina seem to be more critical to the organization problems in extension, which is very interesting since the extension service in Vojvodina is decentralised and under authority of Province Secretary of Agriculture and it is undoubtedly considered as more organized, modernized and financially stronger in comparison to extension organization in Central Serbia[9]. Rural areas in Vojvodina are also in infrastructural sense, land policy and modernization more developed due to historical background and economical conditions of Vojvodina as the most developed region in Serbia.

8 According to Census 2002.

9 If we compare the satisfaction of the way in which the extension work is organized in the agricultural stations, the opinion of advisors from Vojvodina and Central Serbia is pretty similar: in Vojvodina – 34% totally satisfied, 54.3% partially satisfied, 5.7% not satisfied at all, 5.7% do not know; in Central Serbia -36.6% totally satisfied, 58.8% partially satisfied, 3.1% not satisfied at all, 1.5% do not know. If we take into account all of the extension workers in Serbia, majority seems to be just partly satisfied (57.2%) with the organization of extension work in their agricultural stations. That fact tells us a lot about the necessity for reforms, especially in the management of the whole extension service.

Table 1 - Advisors' opinion regarding the most important problems they face in everyday extension activities.

<table>
<tr><th></th><th>Problems related to the farms / farmers' characteristics</th><th>Problems related to the extension organization</th></tr>
<tr><td rowspan="4">Extension staff in Central Serbia</td><td>Farmers' characteristics
- old farmers population
- traditional habits in agriculture; seeking advice after the harm has already been done
- low educational level and lack of knowledge in modern technologies
- low application of science and expert advice;</td><td>Extension organization
- small number of advisors; lack of equipment and laboratories; lack of cars
- lack of permanent education of advisors;
- due to bad and unstable finance, lack of motivation of advisors
- lack of adequate management of the extension service; advisors are in charge for many other duties, including administrative tasks; no strict division between extension and other work/tasks</td></tr>
<tr><td>Financial situation on farms
- inability to apply the advice due to lack of money; low effects of the extension help due to low prices of products and high input prices; unstable agricultural policy; problems with selling the products; low motivation to apply the advice
- lack of money for farming; lack of subsidies, credits for inputs and investments</td><td></td></tr>
<tr><td>Farm characteristics
-small scale agriculture, old mechanization and buildings; bad infrastructure in rural areas</td><td></td></tr>
<tr><td colspan="2">Huge lack of trust of farmers in the government, its institutions and policy; reflection of this fact on extension service (perceiving them as represents of the government's interest; blaming advisors for bad policy, unstable market; bad parities and high input costs); hard work on creation of trust between farmers and extension service</td></tr>
<tr><td rowspan="3">Extension staff in Vojvodina</td><td>Problems related to the farms / farmers' characteristics</td><td>Problems related to the extension organization</td></tr>
<tr><td>Financial situation on farms
- lack of finance for inputs in agricultural production and investments; bad and unstable agricultural policy
- lack of finance to apply what has been advised by the extension service</td><td>Extension organization
- organization and management problems
- lack of finance for extension activities
- overload with non-extension tasks</td></tr>
<tr><td>Farmers' characteristics
- traditional farming
- lack of the basic record on farm (economic and other indicators)</td><td></td></tr>
<tr><td></td><td colspan="2">Lack of farmers' trust in extension due to its link with agricultural policy and government interests</td></tr>
</table>

Source: Petrović, Ž, Janković, D. and Jovana, Čikić (2008). Empirical survey "The role of agricultural stations in agricultural extension in Serbia"

Farmers' needs in extension in Serbia

In the survey we assumed that it may be very important to analyse the estimation of Serbian agricultural advisors regarding the needs that farmers would have during the next five years in the area of their extension activity.

Farmers' needs should be the basis for establishment of adequate extension service, regardless if the service is state-organised or has other type of organization (finance and delivery). It should also be noted that extension services in developed countries have passed through the process of evolution from the transfer of technology model, to the service based dominantly of farmers' needs[10].

Estimations of all advisors point to four dominant needs of farmers in Serbia: 1. farm management, 2. help in establishment of farmers' cooperatives, 3. plant protection and 4. information and advice regarding the agricultural policy (see Janković and Čikić 2008).

The results reveal regional specifics of advisory needs – in Central Serbia these are mostly in fruit growing and plant protection, whereas in Vojvodina besides farm management and plant protection, farmers' need for information regarding the agricultural policy measures is significant[11]. The regional differences exist due to the already mentioned higher level of modernization of farms in Vojvodina, with more intensive (mostly) crop production, better mechanization and overall orientation of Vojvodina region to more intensive agricultural production (even in fruit growing which is more the attribute of Central Serbia). The significance of farmers' cooperation is higher in Central Serbia due to different type of production (fruit, vine, berries) compared to dominant crop production of individual farmers in Vojvodina who are, obviously, more interested in agricultural policy, government subsidies and help with investments (buildings, high value mechanization etc.) partially because of two sources of finance (Provincial Secretary and Ministry of Agriculture)[12].

10 It would be naïve to believe that all extension services in developed countries serve only the farmers' needs, but their long tradition, development and pluralism in extension have averted them from serving the government interests and oriented them more to what farmers need from such service. This is mostly true in extension services where farmers play a key role in determination of goals and extension programs.

11 These results are partly comparable with similar survey of the same issue (see Meier 2000; Boland 1996). Even more valuable information would be to analyze the farmers' needs in extension with farmers themselves, but in absence of such in Serbia it is possible only to suppose that advisors (as experts with much experience) are capable to estimate well what might be the basis for the future extension programs.

12 Data from the analysis of selected approximately 3500 farms in Vojvodinian extension reveal that average farm size is around 16 ha of land in property, with 19 ha of the leased (tenured) land that is far higher than official statistics (around average 3.5 ha of property land). This also shows that selected farms are mostly better-off farmers with more commercial production.

Table 2 - Farmers' needs in extension in Serbia in the next five years (estimation from the side of agricultural advisors).

Farmers' needs in extension	Central Serbia %	Vojvodina %	Republic of Serbia %	Ranking Republic of Serbia
Farm management	16.33	24.17	18.87	1
Farmers' cooperation	12.35	5.83	10.24	3
Fruit growing	10.36	3.33	8.09	6
Plant protection	9.56	17.50	12.13	2
Crop farming	8.76	7.50	8.36	5
Animal husbandry	8.37	4.17	7.01	8
Organic production	8.37	4.17	7.01	9
Vegetable production	6.37	3.33	5.39	11
Agricultural policy	5.98	17.50	9.70	4
Soil analysis, plant nutrition	5.18	7.50	5.93	7
Irrigation	3.98	0.83	2.96	12
other	4.38	4.17	4.31	10
TOTAL	100.00	100.00	100.00	--

Source: Petrović, Ž, Janković, D. and Jovana, Ćikić (2008). Empirical survey "The role of agricultural stations in agricultural extension in Serbia"

Conclusions

From the analysis it is evident that there are certain regional differences in extension problems and that certain differences in farmers' needs in Serbia do exist, as well. Farmers' needs differ due to different modernization level, structure of agricultural population and production, characteristics of farms and historical background and development levels of the two regions that have been surveyed. Similar problems in extension service are present and they are mostly related to the general lack of trust in the government that reflects itself on the extension service and their work. Extension services in both of the surveyed regions have similar problems regarding finance, management, technical support and overload with non-extension activities of the advisors (but advisors in Vojvodina emphasize those problems more than advisors in Central Serbia). This should be the indicator for the government to start dealing with these problems in order to create adequate support for farmers even if this implies greater investments of economic, human and social capital into the service. Without essential reforms of the extension service one can expect that famers won't be optimally supported and also that extension staff (due to low motivation and working conditions) could even leave the service what will be the huge loss for the government and for farmers in Serbia.

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THE "STOCK AND FLOW" APPROACH TO THE GOVERNANCE OF SELF-SUSTAINABLE RURAL SYSTEMS

Pancino B.[1], Bonaiuti M.[2], Franco S.[3]

Abstract

The aim of this study is to present the "stock and flow" model - based on the Georgescu-Roegen bio economic paradigm and on the *ecological economics* principles - in a regional key and to discuss the implications of such an approach on the local system governance in order to guarantee a long term economic, social and environmental self-sustainability. These theories give a dynamic characteristic to this approach, by interconnecting the production process (supply) with the responsibilities of the welfare generation (demand). Starting from this theoretical model, it is possible to look at the integrating modes of production and consumption processes at a local scale that consent to guide a rural system towards conditions of sustainability. This perspective of rural system governance imposes the relocation of the control of resources (stock) to a local level and, therefore, a deep change in the idea of the politic procedures.

Key words: ecological economics, stock and flow, ecological footprint

Introduction

The aim of this study is to present the "stock and flow" model in a regional key and to discuss the implications of this approach on the local system governance in order to guarantee a long term economic, social and environmental self-sustainability.

The "stock and flow" model, which will be briefly described in the second paragraph, is based on the Georgescu-Roegen bio economic paradigm (Georgescu-Roegen, 1971; Georgescu-Roegen, 1975) and on the *ecological economics* principles (Mayumi, 2001; Daly e Farley, 2003). These theories give a dynamic characteristic to this approach, by interconnecting the production process (supply) with the responsibilities of the welfare generation (demand) (Bonaiuti, 2003). Starting from this theoretical model, it is possible to look at the integrating modes of production and consumption processes at a local scale that consent to maintain a rural system in conditions of sustainability or, in the case that these are already exceeded, to guide it towards the recovery.

The conditions of environmental sustainability of a territory are closely tied to its rural connotation; indeed, as it will be discussed in the third paragraph, the presence of strong rural characteristics, determines not only an increase in resource availability for the local population, but it also determines the tendency to reduce the environmental impact of the residents' lifestyles. Therefore, while in the metropolitan areas, the impact of human activities is largely greater than the loading capacity of the territory and, thus, it is impossible to reach self-sustainability conditions (Rees and Wackernagel, 1996; Rees 1997, Martinez-Alier, 2004), in rural territories, it is possible to aim at a model where all the energy needed to sustain the consumption and to absorb the waste of the local community is available on the place.

For this reason, in rural systems, it is possible to look for a kind of governance that, through a

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participative and conscious management of the local stocks, has the objective of maintaining/ recovering balance conditions between consumption and production processes (Midmore and Whittaker, 2000). This balance, as highlighted in the last section of the paper, must be centred around the agricultural sector, which is able to satisfy the local demand of primary goods through the utilization of the technical and natural capital stocks and represents an essential element for the relational good nets that, thanks to their ability to maintain and develop "not material" stocks of knowledge, represent the base for the models of local self sustainability (Laville, 1994; Gui, 1996).

An overview of theoretical framework

According to the "stock and flow" model, the structure of the local economic system can be described starting from the production side (Georgescu-Roegen, 1971; Georgescu-Roegen, 1984; Daly, 1996) and then transposing the theoretical framework to the consumption process.

The production process involves four stock typologies (fig. 1): the natural capital (K_N), taken as organized matter energy system (Costanza and Daly, 1992); the capital (K), taken in its traditional sense, that is to say the combination of tools and machinery used in the production; the social structure involved in the production process, represented by the labour stock (S); the culture, that is to say, the system of know-how and values (no sphere - N) that have a decisive influence on the productive capacities of a society (Berkes and Folke, 1992). Concerning the flows, the production process foresees an input in a flow of natural resources from the biosphere (x_n) which joins a flow of know-how and information from outside the productive system (n_i). Finished products (q_i) and waste (w_i) constitute the two types of outgoing flows. It has to be considered that a certain amount of the flows should be used so that the different stocks are able to maintain their own functional and organisational structure.

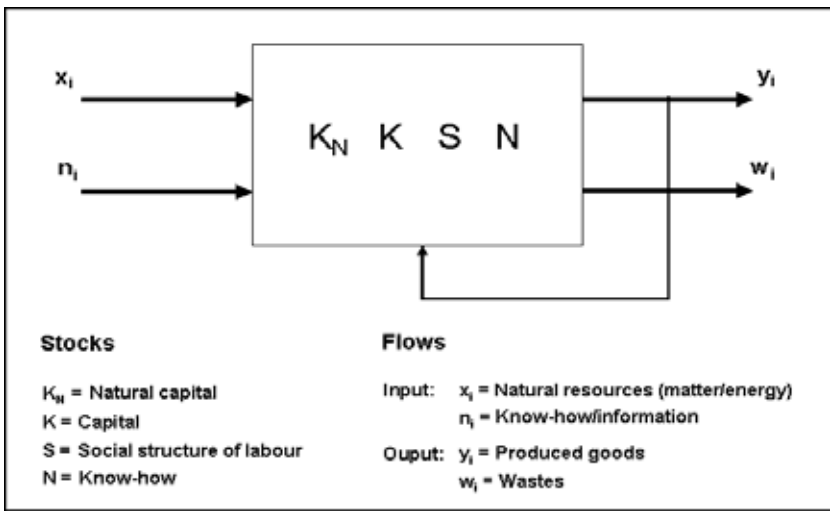

Figure 1 - The system of production: Stocks and Flows

To move towards a systemic analysis of the economic process, the flow and stock approach is extended to the theory of the consumer (figure 2). Therefore, the consumption system is described by a stock and flow model (Bonaiuti, 2008). The stocks involved in the creation of

well-being are the same that characterize the production process: the ecosystems (K_N), the capital (or wealth) owned by "consumers" in the form of lasting goods (K), the system of social relationships (S) and the system of know-how and values (N).

Although the role of natural capital is more obvious in the process of production, both in providing resources and as an agent of transformation, local ecosystems play a significant role even in the demand side. Indeed, an important part of the well-being people can attain depends on the *stock* K_N that *already exists* and requires no effort to be produced (either in the sense of "labour" or in the use of capital), apart from that connected to its preservation. The second type of stock is made up of the wealth (capital) owned by "consumers" (K_C) in the form of lasting goods. The wealth accumulated in the form of lasting goods is a "direct" source of well-being/happiness not connected to the flow of market goods. In order to enjoy such lasting goods, only a modest flow of matter/energy (x_n) is required to maintain them in the same conditions in which they entered the process. That the enjoyment of life is a function of *wealth*, and hence of stocks even more than income (flow), is an important distinction compared to standard theory. Stock S is made up of the social and relational structures contributing to the basic fulfilment of needs. The stock of know-how and values (N), if considered from an individual point of view, reflects the consumer's "preference structure"; actually, it is the resultant of the complex interaction with other subjective values and preferences, social organization and production sphere.

The input flows of the consumption process are the quantities of goods and services (z_i), generally coming from the market, and natural resources (x_i). The output flow is represented by enjoyment of life (L) to which a flow of waste (w_i) produced by the entropic degradation of consumption goods has to be added.

The systemic approach to consumer theory emphasizes how *the flows of goods and services are not able on their own to produce any well-being.* It is the interaction between stocks and flows to originate the enjoyment of individual life and the community's well-being.

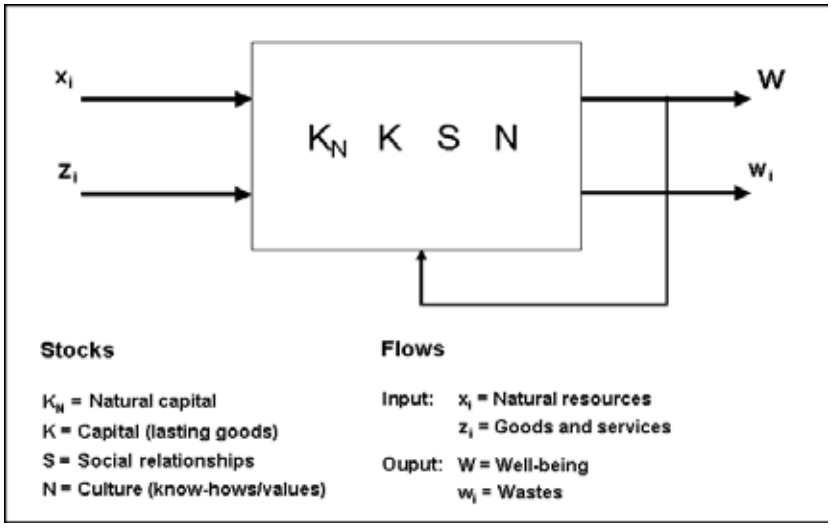

Figure 2 - The system of consumption: Stocks and flows

Check of the conditions of local system sustainability

The integration at a local level of the production and consumption models described through the stock and flow approach consents, on one hand, a global view of the local system in economics and social terms and, on the other hand, offers the chance to verify the environmental sustainability in empirical terms.

In order to achieve this second target, it is fundamental to compare the entering (matter/energy) and the outing (waste) flows of the production and consumption processes that take place in the local system with the ability of the stocks present in the territory (mainly the natural capital) to supply the first and absorb the second ones. To carry out this comparison, it is necessary to have two synthetic indicators: the first one should be capable of quantifying the whole demand of resources coming from the resident population of a territory; the second one should express the availability of the total resources present in the same territory. The two indicators that have these characteristics and that are considered suitable for this purpose at an international level are the Ecological Footprint (EF) and the Bio capacity (BC).

The Ecological Footprint (Rees, 1992; Wackernagel and Rees, 1996) measures humanity's demand on the Earth's ecosystems. It represents the amount of biologically productive land and sea area needed to regenerate the resources a human population consumes and to absorb the corresponding waste. The EF tracks human consumption and waste generation (given prevailing technical and economic processes) in terms of the area needed to provide ecological resources and services – food, fibre, and timber, land on which to build, and land to absorb carbon dioxide (CO2) released by burning fossil fuels (Hails, 2008).

The EF has gained popularity for its pedagogical strength as it expresses the results of its analysis in spatial units, called "global hectares" (gha) that can easily be communicated. In addition, by allowing to compare human impact (measured by EF) to the planet's limited bio productive area (measured by bio capacity), this method tests a basic ecological condition for sustainability (Holmberg et al, 1999).

Indeed, *BC is the amount of biologically productive area – cropland, pasture, forest, and fisheries – that is available to meet humanity's needs.* The BC does not only depend on natural conditions, but on agricultural and forestry techniques too. This indicator is also measured in global hectares, calculated taking into account the average bio productivity of the different land categories, which are constantly adjusted through equivalence and production factors.

By subtracting to the supply of biologically productive area (BC) the relative demand of the local population (EF), an environmental balance is obtained: a negative (positive) value shows an ecological deficit (surplus), that is a situation of un-sustainability (sustainability) in which the consumption of natural resources are greater (lower) than the regeneration levels of the local ecosystems (*Hails, 2008*). The amount of the ecological deficit or surplus represents an estimation of the level of sustainability/un-sustainability of the local population lifestyle compared to the resources of the territory as a spatial dimension (Bagliani et al., 2008).

Relation between sustainability and rurality of the local systems

Once identified the theoretical framework and the empirical tools for the evaluation of the environmental sustainability of the local systems, the relation between environmental sustainability and level of rurality has also been studied. Indeed, besides checking the un-sustainability of the urban areas, it is important, when defining governance models, to express

the conditions of ecological surplus/deficit in relation to the rurality level of the local system.

For this part of the study, 12 Italian provinces, for which the values of EF and BC are available in literature, have been considered (Arpa, 2003; Bagliani et al., 2008; Provincia di Bologna, 2007; Provincia di Milano, 2008; Provincia di Torino, 2005). The Ecological Balance reported in the first three columns of table 1 has been calculated referring to these provinces. The result is a general un-sustainability that in some cases appears of low entity, while in other reaches extremely high levels. This outcome should not be surprising, if we consider that Italy has an EF=4.8 gha and a BC=1.8 gha, with an ecological deficit equal to 3.0 gha (Hails, 2008).

As it regards the evaluation of rurality in the local systems, two aspects must be considered. The first one is represented by the adoption of a clear and pragmatic definition of rurality, from which its identifying characteristics emerge without doubt. The second aspect is measurement that is the quantification of the level of presence of the characteristics that define rurality in the single studied territorial units.

Without entering in the multifaceted debate about the definition of rurality (Blanc, 1997), in this study the definition proposed by OCDE for the classification of rural areas in the member States has been adopted: "*the rurality of a territory is expressed by the quota of residents in municipalities with low population density"* (OCDE, 1994). The provincial (NUTS III) rurality has been calculated considering this definition and adopting a methodology that measures the rural population resident in the single municipalities (NUTS IV) by using a *fuzzy set theory* approach (Franco e Senni, 2001). The rurality level calculated in this way is determined by the density and the population distribution between urban and small inhabited centres. This is a way to look at rurality in a local system that, since it takes into consideration the residential division and, indirectly, the localization of the economic activities, can be effectively put in relation with the resources, available and utilized, of the territory.

The last column of table 1 reports the rurality level, measured in a 0-1 scale and calculated adopting the methodology of the 12 considered provinces.

Table 1 – EF, BC, Ecological deficit and Rurality level in 12 Italian provinces

Province	EF (gha)	BC (gha)	Ecological deficit (gha)	Rurality level
Ancona	6.11	2.07	4.04	0.178
Ascoli Piceno	6.54	2.42	4.12	0.197
Bologna	4.34	1.70	2.64	0.200
Cagliari	5.43	4.03	1.40	0.277
Forlì Cesena	7.43	2.56	4.87	0.175
Milano	4.17	0.14	4.03	0.003
Pesaro Urbino	6.32	3.43	2.89	0.333
Rimini	7.78	0.83	6.95	0.048
Siena	5.80	5.74	0.06	0.502
Torino	3.38	0.43	2.95	0.092
Venezia	5.71	2.33	3.38	0.098
Viterbo	3.31	3.03	0.28	0.632

The correlation analysis between ecological deficit and rurality level shows a value of r=-0,801, which is statistically very significant ($p<0,01$). Thus, it is possible to conclude that, at least in Italy, the greater is the rurality of a territory, the higher is the level of sustainability

(or the lower is the level of un-sustainability) of the human activities that take place there.

This result could be easily predicted by considering the narrow link between rurality and BC, both reversely linked to the density of population; the test shows a very high correlation coefficient ($r=0,763$; $p<0,01$). This is a confirmation of the higher availability of the stock of natural capital in local systems with an elevated rural connotation.

The relation between EF and rurality is less obvious, but even if not particularly high ($r=-0,231$), it shows an interesting tendency, which is that the lifestyle of the populations resident in rural contests appears less expensive in terms of dimension of entering and outgoing flows.

Governance for rural system self-sustainability

The local systems with a high rural connotation are more sustainable from an environmental point of view because, considering their low inhibitive density and population dispersion; they are characterized by a greater individual endowment of natural capital stock. Furthermore, the analysis results highlighted how lifestyles in the rural areas are more sober in the profile of the flows of the consumption system.

This situation is partially explainable due to the fact that rural communities can face their needs by limiting the utilization of out coming inputs by using efficiently the available stocks. The natural capital, represented by agricultural and forestry resources, permits to face the food and energetic needs through a lower utilization of fossil fuels and a larger area for the CO_2 absorption. The stock of relational structures represented by a spread and consolidated net of solidarity economy which still characterizes the social structure of rural communities, allows the supply of services to the local population through non-monetary exchanges (Laville, 1994).

Starting from these considerations, rural system governance that has the aim of maintaining the local community welfare in the long period should focus on the valorisation of the available stocks reaching, at the same time, a flow level compatible with the system self-sustainability conditions. In other terms, it is about making choices that aim for an "efficient" balance between production and consumption processes and within a scale of the production-consumption system compatible with the loading capacity of the local ecosystem, verified through a constant comparison between ecological footprint and bio capacity. Obviously, it should be a dynamic scale that will lead to the development of the system conditioned by the availability of technologies able to reduce the unitary resource utilization and improving the capacity of recycling waste. Therefore, in the case that a territorial system is in conditions of un-sustainability, that is to say with production and consumption processes above its loading capacity, the stock and flow approach imposes the adoption of policies of decrease in input flows in the consumption system, in particular of material goods, and the valorisation of the stocks present in the territory, mainly relational goods (Latouche, 2006).

This prospective of rural system governance imposes the transfer at a local level of the resource control and, thus, a deep change in the idea of the political procedures. On the other hand, only through forms of participative democracy, it is possible to reach an agreement on the welfare production process and thus find the will and the information needed to conserve and increase the value of the peculiar characteristics of a place as wealth (*stock*) to be protected and increased, and not as resources (*flows*) to be exploited for profit (Bonaiuti, 2008).

From this point of view, it becomes necessary to clearly specify the scale of the local system:

this must represent the spatial dimension on which directly analyze the relation existing between human activities and natural resource availability and, at the same time, the place of policy decisions that, through a participative and shared process, must get into proportion the production and consumption processes in order to reach the difficult balance between ecological sustainability and community welfare.

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HUMAN CAPITAL AND SUSTAINABILITY OF RURAL DEVELOPMENT

Milan Milanović[1], Milutin Đorović[2], Simo Stevanović

Abstract

The strategies and policies of agricultural and rural development, within the overall long-term area development, traditionally lean on natural-resource capital and certain differential-rent advantages. New dimensions of the agricultural and rural multi-functionality of areas in the zones of large industrial and urban agglomerations and the inevitable processes of degradation of natural capital, stress the role of science in the process of sustaining the level of overall production potential. This presumes a certain degree of substitution of natural capital with human, primarily intellectual capital. This is the basis for considering the creating possibilities and transfer methods for new scientific knowledge, in the function of reaching a strategic developmental goal – long-term sustainability of the agricultural and rural development of a certain agro-ecological or economic- geographical region.

Key words: resources, capital substitution, role of science, sustainability of development

1. Introduction

The valuation of natural and manmade values and conditions in rural areas, in the production and market context, should be based on the significant agricultural and rural potentials and **developmental advantages** of certain areas. These advantages can be identified in three forms: (1) **natural capital advantages** – diversity and abundance of agro-ecological, ecosystem and rural production potentials and overall natural heritage as an economic resource; (2) **market differential-rent advantages –** proximity of large sales centers, or availability of physical and financing capital (growing purchasing power, developed and growing market infrastructure, retailers, wholesalers, public warehouses, banks etc.); and (3) **human capital advantages** – favorable conditions for creating and reproducing human capital in agriculture (human and intellectual), or acquired knowledge and production experience, as well as the scientific, technical and overall cultural potential that a certain area has at its disposal. In this the network of institutions in the field of agro-economical and biotechnological sciences (secondary school, college and university levels of education, research and scientific implementation) is of determining importance.

The identified developmental advantages of rural areas indicate the necessity of defining the determination to, primarily with (a) long-term sustainability of agricultural and rural development, and (b) production and structural, as well as socio-demographic revitalization of rural zones, (v) secure a better balanced agricultural and rural, and especially demographic development, i.e. (g) a more even / balanced and demetropolized development of urban, suburban and rural areas, as a **strategic developmental goal**.

Apart from the customary structure of the market demand for agricultural produce-foodstuffs, the increase of a specific form of business-tourism demand can be expected, continuously

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throughout the year, and particularly during large international business, political, sports and cultural conventions. Such demand must have its appropriate match in agritourism supply. A specific component of (e) development of the agritourism supply would be not just the diverse, high-quality and secure offer of authentic agricultural produce, but also creating the opportunity for the promotion of traditional values, cultural and historical content and events in authentic rural areas, ecological zones and protected natural values.

2. Science and Profession as the Basis of Human Capital

In the context of the goal of long-term sustainability of agricultural and rural development, and the inevitable degradation processes of natural capital, particularly agricultural land, science, profession and education, as the basis of creating and reproducing human capital, will both absolutely and relatively increase in significance. Agricultural land is rapidly decreasing in favor of the swift regulated or unregulated spreading of urban development land, construction of settlements, for the requirements of industry, utilities, road and other infrastructures.

As is known both in economic theory and in contemporary practice, if the total capital, as production potential, is provisionally divided into:

- *Natural capital* (C_n) and
- *manmade (human)*– physical and intellectual capital (C_h), then one of the criteria of **sustainability of the production potential** of agricultural and rural development would be fulfilled only if it were ensured that
- *the total available capital* (C_n+C_h), did not drop during a foreseeable period of time.

An obvious requirement for the above is to ensure a certain degree of substitution between the various forms of capital, i.e. to compensate the inevitable decrease in natural capital with increase in the available human, primarily intellectual capital. This can, then, be achieved only by increased implementation of already acquired and new knowledge and the best contemporary production practice, i.e. by using the resources of the overall scientific and technical as well as the cultural potential.

The core contribution and main role in the fulfillment of this important requirement is bestowed upon science, profession and education, i.e. the appropriate network of institutions, particularly in the field of agro-economic and biotechnological sciences (secondary school, college and university levels of education, research and scientific implementation). Their programs must be modernized and adaptable to the long-term developmental goal, creating new knowledge, new agricultural technologies and new products, especially new sorts and species adapted to the more efficient use of (probably) altered agro-ecological conditions and resource potentials of a specific economic-geographical area.

If we take a closer look at the network of institutions in the field of agro-economic and biotechnological sciences in Serbia, we will see that the area of Belgrade, as metropolis and capital city, has the highest concentration of higher school and scientific-research institutions[3], the programs and activities of which are of double significance for the fulfillment of strategic

3 The most significant institutions are as follows: **faculties of the University,** in the field of biotechnological sciences – Agriculture, Veterinary Science,, Biology, Forestry and Technical-Metallurgical Sciences; in the field of economy and management – Faculties of Economics, Business Studies, several faculties and colleges in the field of management, etc.; **institutes** – Institute for Agricultural Economics, Corn Institute, Livestock-Breeding Institute, Institute for Medicinal Herbs, Institute for Implementation of Science in Agriculture, Veterinary Institute, Institute for Protection of Plants and the Environment, Meat Technology Institute, the "Agroekonomik" Institute and others.

goals: (1) as teachers educating new professionals, and (2) as researchers occupied with science and research.

The most prominent position in the creating of human capital in agriculture is certainly held by the Faculty of Agriculture of the Belgrade University and the Faculty of Agriculture of the Novi Sad University. Studies at the faculty in Belgrade at all levels are organized in 22 (twenty two) programs-educational profiles[4], and at the faculty in Novi Sad in as many as 32 (thirty two) programs[5]. Both faculties have an impressive number of teachers and teaching associates, as well as other professional and technical associates in laboratories and experimental farms.[6]

> It has been estimated that the acquiring of biotechnological skills and skills in the field of agricultural economics according to new study programs, primarily at agricultural and other faculties and institutes, would enable students at undergraduate and graduate levels to work independently in institutions in the field of agriculture, but not entirely in professional advisory bodies and their role in contemporary conditions without additional specific education. This particularly refers to the content of programs in secondary vocational (and even elementary) schools, particularly in the field of agriculture and food sciences and technologies, the graduated students of which would find their place in these departments as well.
>
> In developed societies with developed agriculture and agricultural industry, during the past several decades advisory practice has shaped into both a teaching and a research discipline under the heading of *Advisory Sciences*. This is actually a very complex discipline, based on learning in the field of Rural Sociology, Communicology, Social Psychology, Adult Education, Management, Systems Theory, Social Anthropology and other social sciences. Advisory science is an integral and very important part of the education of agricultural professionals in all developed societies, as well as in some societies in transition which, through reforms

4 **The Belgrade Faculty of Agriculture** has academic studies organized in four levels (according to the 4+1+(2)+3 system): **Undergraduate academic studies**-bachelor (4 years), 6 programs (Plant Production, Zoo-technical Sciences, Soil Management, Agricultural Technology, Agricultural Economics, Food Sciences and Technologies,); **Graduate academic studies**-master (4+1 year), 9 programs (Crop Sciences and Vegetable Farming, Fruit Growing and Viticulture, Horticulture, Phytomedicine, Zoo-technical Sciences, Soil Management, Agricultural Technology, Agricultural Economics, Food Sciences and Technologies); **Specialist studies**–specialist (4+2), 4 programs (Zoo-technical Sciences, Phytomedicine, Food Sciences and Technologies, Agricultural Economics,); **Doctoral studies**-PhD (4+1+3), 3 programs (Agricultural Sciences, Food Sciences and Technologies, Agricultural Economics,).

5 **The Novi Sad Faculty of Agriculture** organizes academic and professional studies. Academic studies are organized in three levels (according to the 4+1+(2)+3 system): **Undergraduate academic studies-**bachelor (4 years), in 13 (thirteen) programs: Crop Sciences and Vegetable Farming, Livestock Breeding, Fruit Growing and Viticulture, Phytomedicine, Agricultural Technology, Water Management, Usage and Preservation, *Agricultural Economics, Horticulture***,** General, Landscape Architecture, Biotechnical Sciences and Management, Agro-ecology and Environmental Protection, Agritourism and Rural Development; **Graduate academic studies**-master (4+1 year), in 14 programs: Cultivation of Field Plants (5 modules: crop cultivation; vegetable cultivation; cultivation of fodder crops; crop irrigation; agro-meteorology); Land and Plant Nourishment; Genetics, crop improvement and cultivars; Organic Agriculture; Livestock Breeding;. Fruit Growing and Viticulture (2 modules: fruit growing; viticulture); Phytomedicine (5 modules: phytopharmacology; entomology; phytopathology; herbology; agricultural, veterinarian and medical zoology); Water Management, Usage and Preservation, Agricultural Technology, Agricultural Economics, Horticulture**,** Biotechnical Sciences and Management; Rural Development Management, Water Management in Agriculture; Integrated academic studies of the 1st and 2nd level**:** Veterinary Medicine (10 semesters - 5 years); **Doctoral academic studies** (6 semesters - 3 years) in three programs: Agronomy, Animal Production, Agricultural Economics, Veterinary Medicine. **Professional studies-**bachelor appl**.**, organized only on the first study level (undergraduate professional studies, 3 years) in three study programs: Agronomy **(**5 modules: livestock breeding; phytomedicine; crop sciences and vegetable cultivation; fruit growing and viticulture; horticulture); Agricultural Technology and Water Management (two modules: agricultural technology; water management) and Agricultural Economics (two modules: agricultural economics; agritourism and rural development).

6 The teaching and scientific staff of the Faculty of Agriculture of the Belgrade University includes: 71 full professors, 52 associate professors, 36 assistant professors, 1 senior lecturer, 1 foreign language teacher, 66 teaching assistants, 32 teaching fellows, 17 teaching associates and 140 professional and technical associates.

of education in the field of agriculture, strive to stimulate the developmental processes in agriculture and ensure sustainable rural development. As a teaching subject *agricultural advisory science* is still not profiled as such in Serbian faculties of agriculture[7], although such a specific discipline could be formed from the plethora of study programs, educational profiles and so-called modules.

3. How to Achieve the Strategic Role of Science in Development Sustainability

Reaching the given strategic goals, which are basically oriented towards **socio-demographically, economically and ecologically sustainable development**, generally presumes three strategic activity levels: (1) functional organization, (2) applicative education; and (3) effective motivation of direct stakeholders.

3.1. Functionally Connecting Science and Profession

The anticipated structural changes on a resource-developmental basis (less natural and of necessity more intellectual capital) demand that the focus of activities must indubitably be, first and foremost (or almost entirely) on stimulating the development and implementation of new applicative agricultural technologies and applied organizational and managerial methods and skills in direct practice. Essentially, without the active role of the state (at all levels), agriculture cannot be successfully organized and advanced. Fundamental scientific research and higher education, as well as the basic instruments and institutions that ensure macroeconomic stability and basic market guarantees to producers (including import protection and stimulation of agricultural exports) should be within the competence of central governmental authorities.

Therefore, the regional, town and municipal authorities and budgetary institutions of the local self-governance should direct the focus of their activities primarily towards practical advisory services, develop mechanisms for stimulation of the practical implementation of contemporary results of biotechnological and agro-economical sciences, throughout the reproduction chain, from inspection of the quality and cultivation of the land, protection and nourishment of the crops, to the final sale and consumption. The thus stimulated direct implementation of new agricultural technologies and introduction of contemporary production methods will, with the anticipated further reduction not only of the basic natural capital (agricultural land) but of the live labor of the primary producers as well, enable a significant increase in the unit resource productivity and further growth of the volume and quality of the overall agricultural output, in keeping with the growth and structural change of the demand for agricultural foodstuffs.

The most important task of the governmental authorities in charge of agriculture, science and education, both the central authorities of the Republic and the town and local self-governances, is to establish a firm functional relationship between the indubitably respectable scientific potential of faculties and institutes (not just in the capital city, of course) as providers of specific knowledge services, on one hand, and the also respectable production and overall agro-ecological conditions and potential of a certain regional economic-geographical area, i.e. the individual farmers, farms and entrepreneurs of various profiles, as the beneficiaries of such services, on the other. The key then lies in transforming advisory science into advisory practice.

2.2. Applicative Education, Advisory Services and Transfer of Knowledge

The development of primary agriculture, but of processing as well, should lean on the results of scientific

7 As of recently the Faculty of Economics in Subotica added Agricultural Management to the education of students in the Department of Agricultural Economics.

research and their implementation in practice. The fundamental implementers of new agricultural technologies in the function of agricultural and rural development should be scientific research institutions and an authoritative professional advisory department. Agricultural advisory services as a practice have a long-standing tradition, particularly in developed countries with developed agriculture. At the same time, the governments of all societies strive to develop and reform agricultural advisory services and agricultural research, considering the well-known and confirmed fact that investing into this sector pays off many times over, through various direct and indirect effects.

Advisory services in agriculture evolved over time, in keeping with the development of advisory practice and the emerging of problems that needed to be defined and theoretically and practically thought out. The evolution of advisory services actually portrays the development of advisory practice of each country. The "advisory services" of less developed countries have not even reached the **early stage**, in which the main task of the advisers is to successfully transfer production and technical knowledge to farmers; the advisory services of other, developed countries are in the early stage or the stage of providing support to farmers to help them reach good decisions, develop an awareness of their problems and the knowledge and skills to overcome them; the most developed countries (such as the Netherlands) have an established practice of advisory services in the form of a network of relationships between social teachings and negotiations of all participants in the change of farming practice, further development of agriculture and the village as a social community, i.e. multi-functional rural development.

In the given context, agricultural advisory services in Serbia are still in the early developmental stage and with merely certain indications of providing support for farmers to reach good decisions. In fact, as in many other sectors in the transition process, this field has also witnessed retrograde processes. Since the early sixties when professional departments were founded, agricultural stations (agricultural offices, agricultural institutes) primarily acted towards the advancement of the socially- and governmentally-owned and cooperative agricultural sector. The transfer and diffuse dissemination of science and profession in practice was achieved through this sector, through the developed forms of production cooperation and association. The fact that the socially-owned sector is systematically disappearing, that many coops, business associations and other entities in the agricultural infrastructure have been discontinued, necessitates a shift in the focus of advisory services towards individual-farming agriculture.

It is very important for the agricultural advisory services of any society to, among other things, establish the optimum balance between the number of experts and the agricultural-resource community in which they operate. Global experiences differ greatly, but unfavorable relations throughout Serbia can easily be recognized.

Agricultural advisory services in Serbia are for the most part provided through the Institute for Implementation of Science in Agriculture, Belgrade, which serves as the Agricultural department for the Republic (with 33 regional departments)[8]. The Institute now comprises a unified agricultural department with 730 employees, 349 of which are with university degrees (40 PhD's, 33 masters, 13 specialists, 263 graduate engineers) and 381 other employees. This department is expected to provide the appropriate services for around 779,000 farms, which cultivate around 1,920,000 ha of arable land. This means that one adviser with a university

8 This Institute evolved from the Cattle Selection and Accounting Office, Belgrade (founded by Decree of the government of NR Serbia, 1952) and the Agricultural Production Advancement Center of NR Serbia, Belgrade (founded in 1958) and their merger in 1974.

degree should service as many as 2,225 farms, or production on the area of 5,500 ha[9].

For example, in Slovenia, which even in SFRY had the most advanced advisory services of all the Republics (while the role of agriculture in its industrial structure is not nearly as significant as in Serbia), in 2000 the agricultural advisory department employed 308 agricultural experts, in the following agricultural context: 86,467 farms and 485.879 ha of agricultural area. In the Netherlands during the 1990s the governmental advisory sector employed 600 on-site advisers, 200 advisers for socio-economical issues and problems and 2,500 consultants and technical advisers.

The intensive process of further fragmenting of agriculture (largely as a consequence of the mechanical inflow of population – internal migrations) points towards the necessity of a stronger presence of the profession and advisory services in all regions, even in the area of Belgrade. From the viewpoint of advancement of production and rural development, such a situation is unsustainable in the long run, a huge number of farms will still not be included in advisory services, particularly "medium" and "small" family farms (which are the most numerous), the commercial and social importance of which will still be great.

3.4. Necessity of Reform of Advisory Services

The system of advisory services in Serbia needs to be fundamentally reformed. This will partly depend on the (re)organization of the existing advisory network (the Institute for Implementation of Science in Agriculture and regional agricultural stations) and the willingness of the elements thereof to swiftly approach internal changes. In the other, naturally more significant, part, the reforms will depend on the government and its institutionalizing of advisory policies. Such reforms, through the enactment of new regulations (law, by-laws, rules), should cover several different aspects, especially:

(1) resolving the concept and ownership status of agricultural advisory services – which, in our opinion, should be mostly public (governmental), i.e. what and under which conditions would make up private advisory services;
(2) forming the appropriate territorial organization which would enable the advisory department to cover as great a number of producers-farmers as possible (the most important goal of the advisory service), which presumes the development of local advisory services within the overall advisory system;.
(3) stable sources and significantly greater funds for advisory services (secure financing, mostly from the budget, and in a lesser part from the commercialization of certain services);
(4) improvement of human resources and establishing the necessary structure of various profiles (agronomists, veterinarians, agricultural economists, etc.);
(5) a program for the planned and systematic education of advisers;
(6) development of advisory programs and the directing thereof towards the needs of the farmers;
(7) separation of advisory work from activities with a monitoring function;
(8) strengthening management and planning of advisory work;

9 Even in the Belgrade area there is an evident disproportion between the agricultural community and the number of experts in advisory departments, particularly the number of direct advisers, and the total number of farms and arable areas. In the territory of Belgrade there are 60,370 farms (7.75 % of the overall number in Serbia), which cultivate around 104,000 ha of arable land (5.4 % of this resource in Serbia), i.e. 1.72 ha per farm. The average size of farms in the territory of Belgrade is significantly smaller than in Serbia overall (2.46 ha), even in the predominantly rural municipalities (Sopot 2.34 ha, Mladenovac 2.22 ha, Obrenovac 2.15 ha).

(9) establishing a unified information system (with typology of advise and services, charts of farms with all relevant information and farm characteristics, linking of all information and the statistical processing thereof) as a necessary analytical evaluation and monitoring tool, the further development of advisory services and establishing rational and optimal advisory policies, in the service of public (national) interests and the interests of farming agriculture in Serbia.

The authority of the advisory department should lean on two firm foundations: (1) a well-organized network for transferring professional and expert knowledge; and (2) secured financing for the department (mostly from the budget, and in a lesser part from the commercialization of certain services). In accordance with the above, the professional advisory department should:

(a) lean on science – faculties and institutes, in such a manner that each teacher/researcher manages, in the capacity of mentor, a more specific branch, directly contacts the local advisors and a certain number of producers/farms;
(b) apart from the necessary advise relating to the implementation of agro-bio-eco-technological knowledge in production, offer other content as well, and specific agricultural-economical advice, relating to business management, commercial activities; securing information pertaining to the market; the possibility of obtaining funding through mortgage-secured, Lombard and other loans, receipts-warrants from public warehouses etc.; manners, forms and advantages of interest-based association into coops, mechanization rings, clusters etc;
(v) provide services not only to agricultural producers but also to processors and merchants as well, i.e. to all participants in the chain of production, on the following: production, market fluctuations, business economics, ecological and other requirements for environmental protection, production practice conditions, standards and protocols, business plans etc.;
(g) provide evaluation and monitoring of the program for the development and work of the local advisory services, including the licensing of mentors and advisers; the monitoring should cover not only the advisors and their mentors but their clients as well – farmers, producers and other beneficiaries of the advisory services.

4. Conclusion

New knowledge, methods and technologies in primary agriculture, apart from theoretical education and raising the general education level, make up the form of intellectual capital the relatively swift growth of which enables the fulfilling of one of the criteria of sustainability of the production potential of agricultural and rural development, that the *overall stock of capital* (natural and human) not drop during a foreseeable period of time. This satisfies the prerequisite of ensuring a certain level of substitution between the various forms of capital, i.e. that the inevitable decrease of natural capital in agriculture (soil degradation, global warming, spreading of arid areas, change of purpose) be compensated by an increase in the available human, primarily intellectual capital, through the implementation of new agro-bio-eco-technological knowledge in production.

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FARM DECISION-MAKING IN A MULTIFUNCTIONAL CONTEXT: THE CASE OF CONVENTIONAL AND ORGANIC FARMING IN KERKINI DISTRICT, GREECE

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Abstract

Multifuncionality has become a central concern at both conceptual and empirical levels. In this study, a comparative evaluation of the economic performance of conventional and multifunctional farms (mainly organic farms) was conducted for Lake Kerkini region (North Greece) with the use of mixed integer non-linear programming method. Economic performance was evaluated in terms of farm income, resource allocation, production level etc. The results indicate that multifunctional farms have overall better economic performance and young farm managers are keener to adopt multifunctional farming than the older ones.

Key words: Greek farming, multifunctionality of farming, farm, farm decision making and age of farmers

Framing the Issue

An interesting strand of the literature on multifunctionality refers to the attempts that have been made from scholars to operationalise the notion of multifunctional agriculture at the farm level.

Using mathematical programming methods at the farm level, Havlík *et al*. (2005) analysed the impact of various policy instruments on the production of environmental goods, related to agricultural commodities, in view of the uncertainty in output prices and farmers' risk aversion. Additionally, Wilson (2008), conceptualizes the idea of multifunctional transitional processes over time and, introduces the notions of multifunctional path dependency and decision-making corridors.

Multifunctionality is integrated in the policy impact analysis from Buysse *et al.* (2007), with the use of three different, farm-level, mathematical programming models. Moreover, Wilson (2009), suggests that the farm level is the most important spatial scale for the implementation of multifunctional action 'on the ground'; this argument stems from the analysis of different interlinked 'layers' of multifunctional decision-making ranging from the farm level to the national and global levels.

Finally, Aguglia *et. al*. (2009), explore the adoption of diversification and multifunctionality as possible alternative strategies to the agricultural "productivist" model.

The Greek literature is quite poor with regard to studies about the economic performance of multifunctional farms and the joint ness between commodity and non-commodity outputs.

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Recent references on various multifunctional aspects of Greek agriculture include: Barrio and Vounouki (2003), Louloudis, et al. (2004), and Karanikolas *et al.* (2007). These studies illustrate that multifunctional activities are more efficient and can help family farming, as well as, rural communities to improve their overall performance.

Greek agriculture is a highly diversified sector. This diversification results from the high fragmentation of farm holdings, the topography and natural features of Greek landscape (83% of the agricultural area is situated in less favored areas or mountain areas), the multitude of farm holdings (860,000 holdings) and, last but not least, from the scarce resource endowments. Moreover, 36% of all farm holdings have an economic size of less than 2 European Size Units, 67% of holdings occupy less than one Annual Working Unit and 76% use less than 5 ha of agricultural area. The chief goods produced are wheat, corn, olive oil, fruits and vegetables. The age and sex distribution of farm holders is another important aspect of Greek agriculture; 25% of the holders are women, 55% are aged 55 or more (37% are aged 65 or more), and only 7% are younger than 35 years. Finally, only 15% of farm holders are full-time farmers.

The purpose of this study is first, to illustrate whether or not multifunctionality can be a reasonable economic choice for Greek farmers and, second, to examine possible differences in farming decisions between younger and older farm managers.

Methodology and data

To achieve the goals of this study, a mixed integer non-linear programming (MINLP) method was implemented. A general specification of the model follows:

$$(1)\quad \text{Max:} \quad \sum_j R_j X_j - \sum_j C_j X_j + (HSAMT \times HS) + (LSAMT \times LS)$$

Subject to:

$$(2)\quad Ax \le B$$

$$(3)\quad HS + LS \le 1$$

$$(4)\quad DI = \frac{X_{"cows"} \times [10 + (6 \times \gamma)] + X_{"sheep"} \times 1.5}{PST}$$

$$(5)\quad HSAMT = (200 \times X_{"cow"}) + (25 \times X_{"sheep"})$$

$$(6)\quad LSAMT = (25 \times X_{"cow"}) + (6.25 \times X_{"sheep"})$$

$$(7)\quad DI - 1.8HS - M \times LS \le 0$$

Where, j represents the possible enterprises for conventional and organic producers. Regarding the objective function coefficients, R_j represents the gross revenue (in €) calculated at the prevailing market price of the j^{th} enterprise. C_j represents the production cost (including variable costs) of one unit (stremma or head) of the j^{th} enterprise. The decision variable includes X_j which represents the stremmas or head produced of the j^{th} enterprise. Finally, HSAMT represents the high subsidy amount (€) and LSAMT represents the low subsidy amount (€) of livestock subsidies. Binary variables (HS, LS) were created in order to choose between high subsidy and low subsidy payments.

There are six resource constraints in the model: capital availability (€), three types of land availability (dry, irrigated and pasture land in stremmas), labor (available working hours) and machinery availability (available operating hours). Resource endowments include available area

of irrigated land, pasture land and dry land in stremmas, capital availability in Euros, labor and availability in operating hours of machinery. A is the matrix of technical coefficients and B is the vector of resource stocks.

Regarding accounting constraints, DI represents the density index of livestock productivity, γ is the weighted average of the number of cows between six and twenty-four months age and is calculated based on life expectancy and livestock replacement assumptions[4] (for this study γ = 0.8). Equation (7) establishes the density index dependent requirements of receiving either a high subsidy (HS) or a low subsidy (LS) but not both. Thus, if DI is less than 1,8 then HS=1 and LS=0 , otherwise, the DI is not restricted as M represents a very large number.

The data used in this study come from two sources. Firstly, from the National Statistical Agency of Greece and secondly, from, questionnaire based, interviews with the leaders of the farms during the period June-July 2007.

The samples used for this study consist of 25 organic farms, 10 of which engage in eco-tourist activities, and 45 conventional farms respectively. All the organic farms of the area are included in the sample. The choice of the conventional operations was made with the method of stratified random sampling. Organic and conventional farms were divided into three groups with main criterion the land availability for agricultural activities: Firstly, *small farms*, consisting of 10 organic and 18 conventional farms respectively with less than 50 stremmas available. Secondly, *medium farms*, comprising 9 organic and 16 conventional farms respectively, which have between 50 and 100 stremmas available. The third group, *large farms* consists of 6 organic and 11 conventional farms which have more than 100 stremmas available for agricultural activities.

For each one of these groups an "average" conventional and organic farm operation was estimated based on the data coming from the questionnaire. The characteristics of the "mean farms" are presented in Table 1. Descriptive statistics regarding important characteristics of decision makers are presented in Tables 2 through 5.

Table 2 shows that the leaders of organic farms are quite often between 30-39 years old. The age of the manager turns out to be an important factor for decision making. This is so because, younger decision makers are less risk averse and have a bigger planning horizon. From Table 3 it can be seen that, as the size of the farm expands the percentage of the farm managers with off farm activities is declining. Additionally, it can be seen that the percentage of farm managers with off farm activities is higher in conventional enterprises. This is not unexpected because organic enterprises are more labor intensive.

Another important point is related to the education level of farm managers (Table 4). Specifically, as the farm size gets bigger, the education level of managers in both organic and conventional operations increases. This improvement can be attributed to the complexity of problems that have to be answered by the managers of bigger farms.

From Table 5, it can be seen that organic producers prefer direct selling of their products while the conventional producers in their majority prefer selling their products to vendors. This difference can be attributed to some of the factors mentioned above (younger decision

4 The assumptions made are: life expectancy of cows twelve years, cows are replaced at nine years and culled at three years. Calves are sold at twenty months of age

makers, higher education level) and to the fact that marketing channels regarding organic products in Greece have not been fully developed yet. In addition to that, producers said that by direct selling they can avoid the middle-men thus increasing their profits.

Results and Discussion

The results regarding income, shadow prices, slacks and decision variables, for all the types of farms examined in this study are shown in Tables 6 and 7.

From Table 6 it can be seen that, the level of maximum income for all farm sizes (small, medium, large) is greater for organic farms. The incomes estimated from the model are higher than the average income estimated from the questionnaires. This difference can be attributed to several possibilities: 1) the model does not depict the fragmentation of the farm holdings, 2) farm managers may have multiple objectives besides maximizing farm income (for example reducing risk and volatility of income), and 3) the model is static and does not take into account the loss of income from the transition periods. Despite these differences, the model results are not unreasonable and they can act as a good indicator for the difference in economic performance between organic and traditional enterprises.

Another important point is the high shadow prices of pasture land (which has the characteristics of a free good in the examined area) for conventional farms. Since shadow prices indicate the marginal value product of pasture, why do producers not use more pasture to increase their income? The answer to this question comes from the milk quotas imposed by the Common Agricultural Policy of Europe (CAP). If the operation has more animals or more production than the limit placed by CAP then the monetary amount of subsidies will decrease drastically. Greek farmers prefer to have a stable monetary amount of subsidies than to take the risk of increasing production and lowering subsidies without knowing if the extra production can cover the loss of subsidies. Consequently, shadow prices of pasture land likely reflect the subsidies given to cattle producers. In contrast to conventional farms, organic farms do not use all their available pasture land. This is so because organic products have higher returns than the conventional ones so the model allocates the limited amount of labor to crops or to trees instead of cattle.

Furthermore, from Table 6, it can be seen that irrigated land for small conventional farms has a high shadow price. But, the high cost of asset fixity (i.e. irrigation systems) and the extra labor needed substantially reduce this value. Additionally, medium and large conventional farms have higher slack of irrigated land compared to dry land (Table 6). This is due to the more labor intensive nature of farming in irrigated land, which, in conjunction with the limiter amount of available labor leads the model to allocate more labor to dry land.

Moreover, it can be seen (Table 6) that there is a slack of capital and operating machine hours for all the types of enterprises examined. The former, is a result of self-insure methods adopted by the farmers, while, the latter, can be contributed to "lumpy-assets". Specifically, if farmers can not find the machine that exactly fits with their needs they prefer to buy a bigger one, which, may be useful if they decide to expand their operation in the future.

Fourthly, regarding labor, the average wage of an unskilled worker in the examined area (7 € per hour) in conjunction with the shadow prices of labor for conventional and organic farms (7 and 11 € per hour respectively) justifies why there is a substantial big number of organic farms with hired workers, while, conventional enterprises, despite the slack of agricultural area, do not hire off farm workers.

The model results suggest that small and medium producers should have three enterprises and large producers optimally should have two types of enterprises if they are conventional

and three types if they are organic (Table 7). But, the questionnaire results show that small producers (organic and conventional) have on average five enterprises while large and medium producers have three. Two reasons justify this difference. Firstly, small producers have multiple goals beyond the maximization of net farm returns (i.e. equal distribution of the available family labor through the year, cultivation of some products to cover family needs, diversification of enterprises in order to have income even if some type of crops fail etc.). Secondly, farm holdings are highly fragmented (in average every farm has 4 different land parcels). Each parcel of land has different characteristics (e.g., different slope, different yield) that affect the decisions of farm managers, but, the model does not consider these spatial characteristics and differences.

Regarding production levels, Table 7 shows that organic farms should keep the same enterprises as their size gets larger and increase the number of stremmas or the number of head. Meanwhile, the model selects different type of enterprises for the different size of conventional farms.

Another difference between the model results and the questionnaire is the production mix, especially for medium and large conventional operations. Specifically, cotton and tobacco, which are two of the main types of enterprises according to the questionnaire, are not chosen from the model. Three reasons justify this difference: A) The reduction in cotton and tobacco subsidies made these crops less profitable, B) the vast majority of farmers who continue to cultivate those crops are more than 60 years old. A main goal of this group of farmers is to decrease the volatility of their farm income. This objective in conjunction with the high level of risk aversion of elderly farmers and their short planning horizon prevent them from changing their set of enterprises, C) A change of enterprises would require new investments in capital and machinery which is a costly procedure that farm managers especially on smaller farms want to avoid.

Finally, the reduced cost ranking estimated from the model for each of the possible enterprises is consistent with actual enterprise choices made by the managers.

Conclusions

The results of this study indicate that, for every farm type, multifunctional farms have better economic performance than the conventional ones. Moreover, the results illustrate that young farm managers are keener to adopt multifunctional farming compared to older ones. This difference can be attributed to the longer planning horizon of the former and to the fact that older managers have learned to operate under a different environment.

Finally, the structural characteristics of the farms, along with the CAP measures and the existence of multiple objectives, beyond maximization of net farm returns, justify the differences between the model results and the observed facts.

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APPENDIX

Table 1 - Characteristics of the "average farms" by farm size

Size	Type	Irrigated land	Dry Land	Pasture	Capital	Labor	Tractor
		----------Stremmas----------			-€-	-----Hours -----	
Small	Organic	40	0	10	900	1200	150
	Conventional	18	20	15	850	800	120
Medium	Organic	70	0	15	1200	2000	300
	Conventional	33	27.5	20	1600	1400	180
Large	Organic	95	0	15	2000	2600	400
	Conventional	45	45	30	3000	3000	400

Source: Questionnaire results

Table 2 - Age of Primary Decision Makers

	Small farms		Medium Farms		Large Farms	
	Organic	Conventional	Organic	Conventional	Organic	Conventional
30-39	70.0%	33.3%	47.5%	30.7%	30.0%	53.8%
40-49	20.0%	26.4%	22.5%	38.4%	50.0%	23.0%
50-59	10.0%	32.4%	30.0%	23.0%	20.0%	15.6%
60+	0.0%	7.8%	0.0%	7.6%	0.0%	7.6%
Mean	40	47.7	43.6	40	42	41.4

Source: Questionnaire results

Table 3 - Percentage of Primary Decision Makers With Off Farm Activities

Small farms		Medium Farms		Large Farms	
Organic	Conventional	Organic	Conventional	Organic	Conventional
60.0%	70.0%	23.0%	30.0%	15.0%	23.0%

Source : Questionnaire results

Table 4 - Educational Level of the Decision Makers

Education	Small farms		Medium Farms		Large Farms	
	Organic	Conventional	Organic	Conventional	Organic	conventional
Illiterate	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Primary School	50.0%	57.8%	37.8%	53.8%	50.0%	23.0%
Secondary School	40.0%	26.5%	12.5%	30.7%	30.0%	38.4%
High School	10.0%	15.7%	37.5%	7.7%	0.0%	38.4%
University	0.0%	0.0%	12.5%	7.7%	20.0%	0.0%

Source: Questionnaire results

Table 5 - How Products Are Sold

Size	Type	Sold to vendor	Direct sales	Consumed by the family	Used in the ecotourism activities of the farm
Small	Organic	20.0%	60.0%	10.0%	10.0%
	Conventional	57.8%	21.1%	21.1%	0.0%
Medium	Organic	30.0%	70.0%	0.0%	0.0%
	Conventional	76.9%	23.0%	0.0%	0.0%
Large	Organic	10.0%	90.0%	0.0%	0.0%
	Conventional	69.0%	20.0%	0.0%	11.0%

Source: Questionnaire results

Table 6 - Economic results and slack levels by farm type and size

		Small		Medium		Large	
		Organic	Conv	Organic	Conv	Organic	Conv
Net Returns-Model (Survey Results) - €		30,786 (26,530)	24,435 (20,802)	53,403 (44,200)	32,660 (27,700)	60,945 (50,638)	50,803 (45,655)
Irrigated Land	Slack – str*	4.7	(-)	3.4	9	5	13
	Shadow Price	(-)	482	(-)	(-)	(-)	(-)
Dryland	Slack - str	(-)	2	(-)	3.5	(-)	13
	Shadow Price	(-)	(-)	(-)	(-)	(-)	(-)
Pasture	Slack	0.815	(-)	4.08	(-)	2.5	(-)
	Shadow Price	(-)	237.74	(-)	196	(-)	270
Labor	Shadow Price	11.5	7	11.47	7.48	11.36	6.69
Tractor	Slack - hrs	18	16	79.26	68	115	228
Capital	Slack -€	505	358	696	821	332	1683

Source: Model results, *str stands for stremmas

Table 7 - Production level results by farm type and size

Size	Type	Tare-Dry	Tare-Irr	Trefoil	Olives	Cows	Sheep
		----------Stremmas ----------				-----Head -----	
Small	Organic	(-)	26.667	(-)	6.667	3	(-)
	Conventional	14.2	(-)	3.7		(-)	8
Medium	Organic	(-)	28.33	(-)	8.6	1	(-)
	Conventional	24	21	(-)		4	6
Large	Organic		33.3	(-)	33.3	4	(-)
	Conventional	20	21	(-)	11	8	(-)

Source: Model results

RURAL DEVELOPMENT NETWORK AND TERRITORIAL COMPETITIVENESS[1]

Vesna Popović, Branko Katić, Jelena Živanović Miljković[2]

Abstract

In this paper, as a case-study, the authors examine development potentials and capacity building of local actors in one of the future NUTS III regions of Serbia, functional region Kolubara–Mačva-Podrinje, that encompass 14 municipalities of Kolubara and Mačva districts. The results of the situation analysis, including SWOT matrix, indicate local actors' animation and its regional networking as one of the basic factors of territorial development.

Key words: territorial competitiveness, rural networking, capacity of local actors, rural development support, Kolubara–Mačva-Podrinje region.

1. Introduction

Regional differences, regarding the capacity of local actors (knowledge, skills, common values, attitudes, culture, tradition in civil engagement, pronounced local identity and quality of life) and quality of theirs, formal and informal, internal and external networks, can contribute considerably to the territorial competitiveness and to the explanation of differing development results under similar development conditions. The synthesis of ex-ante evaluations of EU RD programmes also exhibits that, in the countries undergoing a process of regionalization and decentralization, many local action groups have evolved into partnership-based local agencies and delivery mechanisms for a wide array of support systems (Lukesch, 2008).

Rural networking in the EU is defined in Article 67 (*European Network for Rural Development*) and Article 68 (*National rural network*) of the Council Regulation (EC) No 1698/2005 on support for rural development by the European Agricultural Fund for Rural Development (EAFRD) and it was launched during the European Commission Conference on rural development in Cyprus, at October 2008. According to the responses provided by the *Survey of National Rural Networks*, carried out by the EN RD Contact Point during February and March 2009, networks are composed mainly of regional network and agencies. United Kingdom has 4 regional networks, Belgium 2 regional networks and 1 national Contact Point, Germany one national and 5 regional agencies, Latvia one central unit and 9 regional expert, regional LAG network is being established in Denmark, all regional levels are active in France and Czech Republic… Main network actors/stakeholders are: 1. Universities and research institutes; public administrations (national and regional authorities); LAG associations; agricultural associations; 2. Association of rural communities; professional and commercial chambers (agricultural chambers); 3. Environmental organizations, local authorities, individuals, education, advisory and rural development institutes; 4. SMEs, social and youth associations. Main tasks of NRNs are: inclusion/integration of all rural stakeholders in the aims of: reinforcing the territorial

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approach, maintaining enthusiasm and ensuring the vertical dialogue (top-down versus bottom-up approach) (Law, 2009).

Following these EU experiences, Serbian Ministry of Agriculture, Forestry and Water Management (MAFWM), within the scope of project *Rural development support capacity building*, established Rural Development Support Network. In this moment, network is containing of eleven regional centers.

The main aims of RDSN establishing are: rural development fostering and balancing, vertical - top-down versus bottom-up dialogue ensuring, and local capacity building for application of Leader approach in RD policy and LAGs establishing, that is expected after 2011[3]. Since 2007, Government has financially supported regional and municipalities' centers as well as potential new rural centers - civil organizations and legal non-profit entities (OG RS, 104/07, 35/08, 18/09, 43/09[4]). Regional and municipality's rural centers, in cooperation with Ministry project team and external consultants have been performed training and information actions, including diffusion of scientific knowledge and innovative practices, using PLA/PRA methodologies.

The Poverty Reduction Strategy Implementation Team has recognized the significance of rural development for poverty reduction and financially supported this MAFWM project of PLA training and RDSN human capacity enhancing[5].

As a case-study, in this paper we examine 1) ***development potentials*** and 2) ***capacity building of local actors*** in one of future NUTS III regions[6] - functional region Kolubara–Mačva-Podrinje, using situation analysis and SWOT matrix. This region includes 14 municipalities of Kolubara and Mačva districts, the major ones being cities of Valjevo, Šabac and Loznica. Functional region, as integral entity of small and medium-sized towns and their rural peripheries, is the most appropriate level for rural development action and implementation, capable to offer infrastructural services and form labor, information and communication markets.

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2. Kolubara-Mačva-Podrinje region case study

2.1. *Situation analysis - Regional Development Potentials*

The Kolubara-Mačva-Podrinje region is positioned in Western Serbia, covering an area of 5,737 km^2, or 7, 4% of the total area of the Republic of Serbia, with a population of 521,829 living in 446 settlements. The region has a good road (M21, M24 and M19) and railway connections (Belgrade – Bar railway). The planned route of the Belgrade-South Adriatic highway goes through three municipalities which will incorporate the region into the international transport corridors 10 and 7. The Sava River connects the region to Danube European water corridor (Figure 1b).

3 During II phase of RD National Programme (2011-2013) (MAFWM, 2009).

4 In line with Amending budget for 2009, the related budget appropriation was cancelled and the financial support was assured by donations.

5 http://www.ruralinfoserbia.rs.

6 According to Draft Survey of Republic Statistical Office, 2009.

Figure 1 - Kolubara-Mačva-Podrinje region – geographic position

Figure 1a. Region's municipalities

Figure 1b. Region's position in Serbia

Source: Regional Chamber of Economy Valjevo, http://www.inwestserbia.com.

The main results of the internal and external situation analysis were presented in table 1.

Table 1 - Kolubara-Macva-Podrinje Region - *main development indicators*

		Republic of Serbia	11 Region's small municipalities	Republic of Serbia = 100%	14 Region's municipalities	Republic of Serbia = 100%
1	Area (km^2)	77474	3429	4,43	5737	7,41
2	Utilized agricultural area (000 ha)	5105	236,5	4,65	391,2	7,66
3	Arable land and permanent pastures (000 ha)	4765,9	217,3	2,56	357,8	7,51
	- Share in utilized agricultural area (%)	93,4	91,9		91,5	
4	Settlements	4720	262	5,60	446	9,45
5	Population per 1 km^2	97	63		88	
6	Population – by Census 2002	7498001	215062	2,86	521829	6,95
7	Economically active population – by Census 2002	3398227	109931	3,23	259677	7,64
	- Share in total population (%)	45,3	51,1		49,8	
8	Agricultural population – by Census 2002	817052	79611	9,74	128708	15,75
	- Share in total population (%)	11,00	37,00		24,70	
9	Agricultural economically active population – by Census 2002	529236	54489		86961	
	- Share in total economically active population (%)	15,57	49,57		33,49	
	- Share in total agricultural population (%)	64,80	68,40		67,56	
10	Agricultural holdings	778891	44549	5,70	76651	9,84

		Republic of Serbia	11 Region's small municipal ities	Republic of Serbia = 100%	14 Region's municipal ities	Republic of Serbia = 100%
11	Agricultural holdings – income sources structure (%)					
	- Agricultural	17,80	34,72		32,50	
	- Non-agricultural	62,30	38,35		41,96	
	- Mixed	16,40	23,75		21,76	
12	Population aged 15 and over, by education (%)					
	- Without education and unfinished primary ed.	21,9	39,0		30,4	
	- Primary education	23,9	26,2		24,2	
	- Secondary education	41,0	28,9		36,5	
	- High and higher education	11,0	4,2		6,8	
13	National income per inhabitant (dinars), 2005.	123473	71915	58,2	97320	78,8
	Share of main 4 sectors (%), national income = 100	76,1	87,4		84.8	
	A Agriculture, hunting, forestry and water works sup.	17,0	58,9		31,5	
	D - Manufacturing	27,1	13,8		33,3	
	F Construction	7,3	4,3		4,0	
	G Wholesale and retail trade; repairs	24,7	10,4		16,0	
14	Investment in new fixed assets (mill. dinars), 2007.	482341	1951,4	0,40	13351,2	2,77

* *National income* (net product) is a newly value added (GDP subtracting depreciation).
Sources: Republic Statistical Office. Municipalities in Serbia, 2006, 2007 and 2008; Census 2002.

Although having in its disposal all of these location and significant resources possibilities, this predominantly agricultural region is lagging behind national average according to almost every socio-economic indicator. It is particularly conspicuous for eleven small municipalities of the Region. The increased intra-regional differences in development results, which appear in spite of similar resources abundance conditions, give the arguments that ***regional and local actors' capacity and network play a great role in regional economy development and need to be strengthened.***

2.2. Situation analysis - Capacity building and networking of local actors

All the municipalities of the Kolubara-Mačva-Podrinje region, except Ocečina, are comprised within 2 regional RDS centers:

1. *Regional center for rural development for West Serbia* – Loznica, that, also encompasses 11 municipality's centers (Šabac, Loznica, Valjevo, Lajkovac, Bogatić, Vladimirci, Koceljeva, Ljubovija, Krupanj, Mali Zvornik and Bajina Bašta); and
2. *Regional center for village development Moba* – Ljig, that coordinates 11 municipality's centers (Čačak, Gornji Milanovac, Ljig, Kosjerić, Mionica, Knić, Topola, Rača, Lazarevac, Ub and Smederevska Palanka).

As a results of it's activity, *Regional center for rural development* for *West Serbia – Loznica*, in its Survey[7] stands out: reached partnership with municipalities; organization and equipment of 12 local centers in 11 municipalities and employment of 12 persons - members of local development partners; promoting of Ministry's measures of support; offering of information and advices to 2480 registered agricultural holdings and 226 legal entities and entrepreneurs; offering of 666 consulting services for farmers and 216 for potential farmers; implemented education of potential fruit producers, education of persons for public advents and performed lectures for 119 persons; constantly briefing of stakeholders and wider publics about network activities, accomplished PLA analysis for village after organizing of instructive seminar (the village identification maps), organized requests preparing for farms registration, established services for livestock registration in two municipalities; and accomplished cooperation with Republic of Srpska and Slovenia.

The *Agricultural producers association Moba* achieved good results in developing of local partnership since its establishment in 2002 until obtaining the status of regional center for rural development. The Association gathers agricultural producers from the area of Ljig municipality and other parts of Serbia, agricultural experts, scientific workers and entrepreneurs in the joint work regarding revival and development of Serbian villages and agriculture through: organization and association of farmers; promotion of agriculture; protection, restoration and development of the Serbian village and its natural, cultural and spiritual values; production of high quality and safety food with environment protection; support and development of organic agriculture; internet application services in agriculture; advisory services and knowledge diffusion to farmers; organization of scientific and professional meetings, seminars, workshops, exhibitions; representation of institutions and companies; joint appearance on the market; marketing and promotion of brands and protection of the rights and interests of farmers.

In its Survey[8], *Regional center for village development Moba – Ljig* summarizes results: cooperation and partnership with municipalities and organizations from Central Serbia (by visiting of 190 settlements in Central Serbia); employment and coordinators' training for giving information about general strategies, agricultural and rural support program and activities of MAFWM by: organizing of tribunes, direct contact (4507 of beneficiaries), telephone (2542 of beneficiaries), green market attendance (823 of beneficiaries), creating and distribution of 5 000 promo flyers, by questionnaire and by local printed and electronic media; database setting up, by collecting data related to rural development from the field; international cooperation strainghten and organization of RDSN Meetings.

The municipalities also have continued separated efforts on local development capacity building. In May 2007, the municipalities of Šabac, Valjevo, Koceljeva, Krupanj, Vladimirci, Bogatić, Osečina and Lajkovac founded the Regional centre for SME_s development. In August 2007, the national Municipality and City Managers Network were founded in Koceljeva.

All of these associations should contribute to fostering capacity building of local actors and its network with all relevant development agents in the country and abroad. But, the increased intra-regional differences in development results give the arguments for *regional and local actor networks strengthening* ***in the territory of Mačva and Kolubara district (14 municipalities)***

7 http://www.ruralinfoserbia.rs/index.php?1=1.
8 http://www.ruralinfoserbia.rs/index.php?1=1.

as a whole. Network of regional rural support centers at present do not coincide to expected NUTS regionalization.

2.3. SWOT Matrix of regional competitiveness factors

As mentioned above, the internal and external situation analysis produces a large amount of information, much of which may not be highly relevant. The SWOT matrix as an interpretative filter reduces the information to a manageable quantity of key issues. Generated SWOT profile is the basis of goals setting and strategy formulation and implementation[9]. In this case, it will be used as the basis of recommendations and conclusions defining.

Table 2 - Kolubara-Mačva-Podrinje Region - *SWOT Profile*

Strengths	Weaknesses
▪ favorable geographical position; ▪ mild and moderate climate and a balanced distribution of rainfall; ▪ available natural resources (arable land, waters, mineral resources, nonmetals and thermal springs, woody mountains rich in various game, rivers rich in fish); ▪ accessibility and tourism potentials; ▪ production of high quality and safety food with environment protection; support and development of organic agriculture; ▪ tradition and quality in productions of maize, fruits and livestock as input base for food industry development; ▪ foreign investment success stories in the Region's economy, specially in the food industry (Rauch, Grünewald International - Podgorina Frucht d.o.o, Rostfenix, Vindija); ▪ agricultural producers associations, like Moba and partnership-based regional agencies like Regional Chamber of Economy - Valjevo and Regional centre for SMEs development - Šabac achieved good results in developing of local partnership; ▪ regional and local centers for rural development in the joint work regarding development of agriculture and rural areas.	▪ poor local infrastructure; ▪ education structure of region's population bellow the national average; ▪ share of agricultural population in total population higher than the national average; ▪ higher share of agriculture and lower share of trade and other services in GDP sector structure than the national average; ▪ higher percentage of agricultural holdings with agricultural and mixed income sources relative to national average; ▪ land fragmentation, outdated mechanization ▪ very low region's share in national GDP, investments, average salaries, employment; ▪ non-developed regional administrative structures and LAGs; ▪ network of regional rural support centers at present do not coincide to functional region's frontiers, i.e. to expected NUTS regionalization; ▪ in the RDS network is still present few partners – mainly agricultural producers; there is no cooperation with enterprises, cooperatives or with chamber of commerce; support for local authority is organize-verbal nature and in some municipalities is generally missing.

9 http://www.netmba.com/strategy/swot/.

Opportunities	Threats
▪ new investment opportunity and facilities in industrial free zones in Šabac, Koceljeva, Lajkovac, Loznica, M. Zvornik, Krupanj, Bogatić and Vladimirci (concessions for projects in infrastructure, energy and ecology; lease from 10 to 99 years; employment incentives…); ▪ utilization of EU IPA (RD) funds; ▪ border region eligible for EU CBC programmes; ▪ establishment of Local action groups (LAG's) that will contribute to programming and coordination of local areas development, and to better utilization of EU IPA funds.	▪ political uncertainties and delays in EU accession process and pre-accession fund utilization; ▪ world economic crises, macroeconomic uncertainties, budget and credits shortages; ▪ delays in transition process (lack of some basic legal acts, slow and unsuccessful privatization process, high level of corruption, non-briefing and delayed information, mistrust to public institutions); ▪ migration of young people to urban centers; ▪ land competition between agriculture and industry/mining/construction sector.

The generated SWOT Profile gives the basis for followed ***recommendations for future activities in regional actors' capacity building*** that should be concentrated to:

- accomplishing of the training for current and new-opened rural centers-offices; activating and strengthening cooperation with enterprises, cooperatives and chamber of commerce, agricultural experts, scientific workers, universities and research institutes; public administrations (national and regional authorities); association of cities and municipalities; environmental organizations, social and youth associations;
- reorganizing present regional and local RDS network according to NUTS III expected subdivision. It would be better that one regional RD center encompass the territory of Mačva and Kolubara district as a whole;
- volunteer-associates should be found in every village, which will contribute more successful work of network on the field;
- organizing and accomplishing of training related to start business with agriculture and rural entrepreneurship; organizing of farmer management training by study tours and visiting successful farms in the country and in abroad, so they could be enabled for independent acting and to achieve necessary self-confidence for innovation and diversification of activities;
- establishing Local action groups (LAG's) which would contribute adequate programming and coordination of local areas development, and to better utilization of EU IPA (RD) funds.

3. Conclusions

More creative local development strategies designed through highly open and participatory approaches and new ways of supporting partnership creation and development between public, private and non-governmental actors are essentials. Leader-like local action groups and rural networking are instruments for realization of these aims.

Network should be strainghted, at the first place trough training and constantly education of coordinators and trough encouraging of cooperation and connection inside of network; thence trough connecting with the rural development networks in the EU and WBC countries.

National network should be reorganized regionally, according to NUTS III expected subdivision, in order to coordinate with development initiatives easier. NUTS III regions are the levels on which support to the regional development and IPA cross-border cooperation support will be concentrated.

Only communities and regions with well developed local actors capacity and their dynamic internal and external, i.e. horizontal and vertical networks can support learning and innovation processes as a key source of competitive advantages and a key multiplier of economic activity, employment and development.

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HOW DO PUBLIC INSTITUTIONS SELECT COMPETITIVE AGRICULTURAL R&D PROJECTS? - THE CASE OF AN ITALIAN REGION[1]

Valentina Cristiana Materia[2], Roberto Esposti

Abstract

This paper analyses, through a Random Utility Model (RUM), how a public institution selects among competitive agricultural R&D projects on the basis of observable distinctive features. In particular, we aim at verifying if, which and how other criteria, beyond the pure scientific value, are decisive for selection. From such information, like cost, duration, etc., the institution must infer about the unobservable actual ability, effort and reliability of the scientists themselves. Such analytical framework is empirically applied to a real case, the agricultural R&D activity funded by the Emilia-Romagna Region (Italy) between 2001 and 2006.

Key words: Public Agricultural R&D Funding, Random Utility Model, Logit Model. JEL: Q160, O320

Introduction

Over the last decades, the economic analysis of R&D public funding progressively shifted from the optimal amount of R&D investments to the optimal mechanisms to deliver the available limited resources to research activities (Huffman and Evenson, 1993; Huffman and Just, 1994, 1999a; Pardey e Beintema, 2002; Pardey *et al*., 2006; Spielman e von Grebmer, 2004). Actually, this latter question brings the management of public research (not only in agriculture) at the centre of attention (Huffman and Just, 2000). Public research always involves two different agents, whose aims diverge: a funding institution that wants to gain from its investment the highest welfare increase (pay off), and the researchers who want to maximize fund raising and progress in their career. According to Huffman and Just (2000), there are alternative public agricultural research funding mechanisms, namely, possible contracts between the two players taking account of, at once, their clash of interests as well as of two essential characteristics of R&D: information asymmetries and high riskiness (Materia, 2008).

At many different levels (regional, national, European), competitive funding has become the predominant way to grant co financing to research proposals selected by independent experts (peer-reviewers). This paper aims at analysing the process by which a public institution selects among competitive research projects. We set up a Random Utility Model (RUM) to analyse, on the one hand, the choice of researchers to participate to the competition (auto-selection) and, on the other hand, how the public selects the best projects among those presented. Initially, the public bases his choice on the scientific and technical merit of the proposals, relying on an independent assessment (peer-reviewers). This assessment, however, provides incomplete information. There are, in fact, other important but unobservable determinants of research outcome, such as the actual skill, effort and reliability of researchers themselves. The public can infer this information relying

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on factors the peer-reviewers do not consider, but that can be still observed: project cost, duration, previous knowledge of the characteristics of the scientists, etc.[3]

The aim of this paper is, therefore, to assess if and which additional elements, beyond the scientific merit, affect project selection.

The model

Consider the two players involved in the R&D activity: the public funding institution (hereafter: the public), and more researchers that compete for selection and carry out the research activity. For the sake of simplicity we assume that both are risk neutral[4]. The public allocates its limited budget selecting and co financing the best projects. On the one hand, researchers themselves can decide whether or not to spend time and effort to compete for research funds (self-selection). On the other hand, the public has to select projects on the basis of incomplete information. First, the public relies on a panel of experts (peer-reviewers) assessing the scientific and technical merit of each proposal. In addition, however, the public may also take into consideration other non-scientific elements of the project, such as cost, duration, pre-existing knowledge of the proposer's reliability, etc.

The representation of both researchers' self-selection and public selection is based on Random Utility Models (RUM) applied to discrete choices (Train, 2003). Let consider N agents, each with an utility function, i.e. U_i (with i=1, …, N). The agents can choose among M possible alternatives. To the j-th choice (with j=0, .., M) we can associate the respective agent's utility, U_{ij}. The RUM assumes that whenever the i-th agent chooses the alternative j-th, it is:

$$U_{ij} > U_{ik}, \forall i = 1,...,N, \forall j,k = 0,...,M \quad (1)$$

i.e., the agent always chooses the alternative that gives him the highest utility. The conventional specification of the utility function is:

$$U_{ij} = X_i' \beta_j + \varepsilon_{ij} \quad (2)$$

where X_i is the (*px1*) vector of utility determinants, β_j the (*px1*) vector of parameters associated to the j-th alternative, ε_{ij} is the disturbance term expressing the stochastic and unobservable factors eventually affecting utility. The presence of the stochastic error term allows to derive a continuous latent variable, $\Pr_{ij}$, expressing the probability that the i-th agent chooses the j-th instead of the generic k-th alternative:

$$\begin{aligned} \Pr_{ij} &= \Pr\left(U_{ij} > U_{ik}\right) = \Pr\left(X_i' \beta_j + \varepsilon_{ij} > X_i' \beta_k + \varepsilon_{ik}\right) \\ &= \Pr\left[X_i' \left(\beta_j - \beta_k\right) > \varepsilon_{ik} - \varepsilon_{ij}\right] = f\left(X_i' \beta_{jk}\right) \end{aligned} \quad (3)$$

$f\left(X_i' \beta_{jk}\right)$ can assume alternative forms; the most known are the Logit and Probit models.

[3] If the funding institution would make these additional elements explicit, this could generate consequent strategic behaviours by the researchers to increase their chances of being selected. For this reason, this additional evaluation tends to be not formalized in order to preserve the belief among researchers that the scientific merit is the only relevant factor (Materia and Esposti, 2009).

[4] Risk neutrality implies that the stochastic nature of research affects utility only as expected result while its variance is not relevant.

Researchers (R) auto-selection

The *i*-th researcher can choose among two possible alternatives: to take part (*j=1*) or not (*j=0*) to selection. He finds convenient to participate only if the utility associated with this choice, net of effort and resources spent to prepare the project, (U_{i1}^R) exceeds his reservation utility, i.e., the shadow-value of his effort and ability in alternative research activities (U_{i0}^R): $U_{i1}^R > U_{i0}^R$ ($\forall i = 1,..,N$). We can represent the researcher utility function as an implicit function of his characteristics and of the project itself: $U_{i1}^R = R_{i1}^R(\theta_i, e_i, C_i) + \varepsilon_{i1}^R$ and $U_{i0}^R = R_{i0}^R(\theta_i, e_i, (1-\mu_i)C_i) + \varepsilon_{i0}^R$, where $R_{i1}^R(\theta_i, e_i, C_i)$ is the expected return of the project in terms of research output (publications, patents, etc.), and is a function of researcher skill (θ_i) and effort (e_i) both unobservable, and of the resources invested in the project, namely its cost (C_i); μ_i is the co financing rate granted by the public. $R_{i0}^R(\theta_i, e_i, (1-\mu_i)C_i)$ is the reservation utility expressed as the return (research output) that would be obtained by the same skill and effort in alternative research activities for which, however, the researcher misses the public co financing ($\mu_i C_i$). Therefore, the probability for the researcher to participate to the selection is:

(4)

$$\Pr_{i1}^R = \Pr\left(U_{i1}^R > U_{i0}^R\right) = \Pr\left[R_{i1}^R(\theta_i, e_i, C_i) + \varepsilon_{i1}^R > R_{i2}^R(\theta_i, e_i, (1-\mu_i)C_i) + \varepsilon_{i0}^R\right] =$$
$$= \Pr\left[R_{i1}^R(\theta_i, e_i, C_i) - R_{i2}^R(\theta_i, e_i, (1-\mu_i)C_i) > \varepsilon_{i0}^R - \varepsilon_{i1}^R\right]$$

Among researchers that decide to participate, the public must select the projects to be funded.

Project selection by the public institution (P)

The public institution can choose to select (*j=1*) or not (*j=0)* an R&D project. For the public, the utility associated with any *i*-th project (if selected) can be expressed as $U_{i1}^P = R_{i1}^P(\theta_i, e_i, C_i) - \mu_i C_i + \varepsilon_{i1}^P$, where $R_{i1}^P(\theta_i, e_i, C_i) - \mu_i C_i$ represents the expected value of the project outcome, in terms of social welfare, net of public co financing $(\mu_i C_i)$. As before, the expected return depends on researcher effort (θ_i), skill (e_i), and on resources invested (C_i). The reservation utility, concerning non-selection of the *i*-th project, is $U_{i0}^P = (\mu_i C_i)^\rho + \alpha B + \varepsilon_{i0}^P$ and represents the value, net of public costs, generated by the alternative use[5] of public funding $(\mu_i C_i)$ of which ρ>0 is the respective return parameter. Moreover, the assumption is made that the reservation utility grows as the budget constraint increases, i.e., as the total available resources to support R&D (*B*) decreases. The public institution, in practice, tends to save financial resources as the budget becomes more binding and parameter α expresses such effect. Therefore, the probability that the public selects the project is:

[5] For example, investments in public infrastructures.

(5)

$$\Pr_{i1}^{P} = \Pr\left(U_{i1}^{P} > U_{i0}^{P}\right) = \Pr\left\{R_{i1}^{P}\left(\theta_i, e_i, C_i\right) - \mu_i C_i + \varepsilon_{i1}^{P} > \left(\mu_i C_i\right)^{\rho} + \alpha B + \varepsilon_{i0}^{P}\right\} =$$
$$= \Pr\left\{R_{i1}^{P}\left(\theta_i, e_i, C_i\right) - \alpha B - \mu_i C_i\left[1 + \left(\mu_i C_i\right)^{\rho-1}\right] > \varepsilon_{i0}^{P} - \varepsilon_{i1}^{P}\right\}$$

The empirical analysis

This analytical framework is empirically applied to the agricultural R&D co financing carried by the Emilia-Romagna Region (Italy) between 2001 and 2006 according to the pluri annual programme established by regional law[6] LR 28/98. Evidently, only the empirical analysis of project selection according to (5) is feasible with these empirical observations, not the self-selection of the researchers according to (4). Though only projects and proponents taking part to selection are observable, however, it should be always reminded that the sample of projects here analyzed may actually suffer from self-selection in terms of some inherent characteristics of the researcher and the project (skills, reliability, effort, cost, risk, etc.). LR 28/98 is an example of competitive research funding as it funds projects selected among those submitted (1221 in the present case). Selection is firstly based on an evaluation performed by a panel of independent experts (peer reviewers) attributing a score expressing the scientific and technical merit. Depending on the available budget and on possible other considerations, the Region eventually choose the funded projects (589 in the present case). LR 28/98, therefore, is a concrete example of how public research may consider additional factors, beyond the scientific merit, to choose among competing R&D projects.

The adopted dataset thus consists of n = 1221 observations (projects) for which the following information are available: score given by peer-reviewers; duration (months); monthly cost (total project cost divided by its duration); year of funding; type of proponents; type of projects by sector. About the latter aspects, according to LR 28/98 each research project is classified into five areas (or sectors): "crops", "livestock", "farm management and rural development", "environment", "marketing", while for proposers a distinction is made among firms, laboratories and research centres (such as university departments), but particularly whether the project is presented by the "organizers of research demand" (ORD)[7]. Such institutions are key-actors in the enforcement of the law and in delivering the funds, since coordinate and mediate between research and agro-food production. In the empirical specification, therefore, dummy variables are included to take account of both sectoral specificity and the peculiar proposer (ORD).

Evaluation score is, for the Region, a reliable measure of scientific merit, while project duration can be assumed as the proxy of unobservable researcher effort e_i. The cost, in turn, expresses the size, in financial terms, of the project that also depends, however, on its duration. To avoid co linearity with the latter, therefore, we include the monthly cost as a variable. The sectoral dummies are proxies of the different skills/reliability the Region associates to projects belonging to different areas. A possible higher trust on R&D proposal also justifies the dummy related to the proponent ORD. Finally, the time dummies identify the year of real funding of the project and assess whether the public actually experienced increasing selectivity over years. As there is no information on the exact overall volume of funds annually allocated by the Region, these time dummies are useful proxies of this unobservable time-varying budget constraint.

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[6] Region Emilia-Romagna made these data available under a research project untitled "Valutazione della spesa per ricerca, sperimentazione e sviluppo tecnologico in agricoltura: la legge 28/98" ("Evaluation of expenditure for agricultural research and technological development: law 28/98") funded by the Region itself and carried out by the Associazione Alessandro Bartola (Materia e Esposti, 2008).

[7] They are the following two research centres: *Centro Ricerche Produzioni Vegetali (CRPV)* and *Centro Ricerche Produzioni Animali (CRPA*).

Table 1 summarizes the variables used in the empirical analysis and their interpretation with respect to model (5). Among dummy variables, year 2001 and "crop sector" dummies are excluded[8]. Except the dummies, all independent variables are standardized in order to better compare the magnitude of the respective estimated coefficients and marginal effects estimated. Three alternative specifications of (5) are considered here. First, we use the binomial Logit that simply considers the two possible choices of the public: to select and fund ($j=1$) or not to select ($j=0$) the project[9]. Then, we explicitly take into account the third possible choice, namely that, due to the limited budget, some selected projects are actually funded ($j=2$) while others are not funded ($j=1$)[10].

A RUM admitting three different possible outcomes may be in turn specified in two alternative ways: as a multinomial or as an ordered model[11]. The difference between the two cases is that in the multinomial specification the three possible outcomes are represented in the form of multiple options without any hierarchical order, whereas in ordered models an order (or sequence) of preference among the alternatives is assumed. This latter case seems more suited for the two-stage selection considered here: first, projects are selected according to the scientific merit; then, the choice of those to be actually funded is made also on the basis of additional elements the public decides to take into account. This also makes explicit that the motivations driving the two stages may actually differ. In addition to the binomial Logit, therefore, a multinomial Probit and an ordered Logit models are estimated[12].

Results

The present empirical analysis aims assessing which, how and to what extent other factors, beside the scientific value, condition selection and funding of an R&D project. Table 2 reports estimated coefficient and marginal effects of the simplest specification, the binomial Logit. On the one hand, the score assigned by independent evaluators evidently remains the main factor of choice: it is the variable with the greatest impact (in absolute value) on choice. This is substantially confirmed also by the multinomial and ordered specifications (Tables 3 and 4)[13]. On the other hand, however, also other elements matter: it emerges that the Region tends to prefer, given the scientific merit, projects of a considerable cost if proposed by an ORD: in this context, presumably a higher cost becomes an indicator of greater public relevance and the presence of the ORD ensures reliability and competence. The duration of the project, in contrast, does not show a significant effect, though it is negative thus indicating that the greater duration of the project, *ceteris paribus*, implies an excessive financial burden and increases the uncertainty about the outcome. With regard to the

[8] The "marketing sector" dummy has not been taken into account as well, because only two funded projects belong to this group.

[9] A binomial Probit has been also estimated: results essentially coincide with the Logit.

[10] Considering the entire period and the 1221 submitted projects, 589 have been selected and funded ($j=2$), 336 not selected ($j=0$) and 296 selected but not funded ($j=1$).

[11] A further alternative could be the nested Logit specification. This model seems appropriate in this case as the choice is made, as mentioned, on two different levels with a sequential structure of choices. Such model specification, however, is not affordable in the present application. In the nested Logit the determinants of any alternative choice are specific for that decision level. In this respect, no information is available about what are the criteria for the first level of choice and those of the second level as this two-stage procedure is not, in fact, formalized. Level-specific variables could be still tentatively defined on the base of empirical results. Nonetheless, this would not solve the problem because available data do not provide alternative-varying variables as all variables concern the project/proposer not the alternative (select and fund or not). Therefore, as within-case variability is missing, the nested Logit model can not be specified and estimated in this case. For this same reason also the conditional Logit specification is not viable here (Cameron and Trivedi, 2005).

[12] The choice of the Probit specification instead of the Logit in the multinomial case is due to the fact that the multinomial Logit model incurs in the violation of the assumption of independence of irrelevant alternatives (IIA) (Cameron and Trivedi, 2005).

[13] Even though it loses significance for the group of projects selected but not funded, choice obviously guided by other criteria and evaluations of merit.

sector of the projects, it emerges that a project belonging to "farm management and rural development" area apparently incurs a lower likelihood to be selected; the opposite holds true for projects of the "environment" sector. Political priorities about these various issues, therefore, seem to significantly overlap the purely scientific merit.

For what concerns the financing years, 2003, 2004 and 2006 dummies are significant and show an order of magnitude comparable to the parameter associated to the ORD variable; this confirms that the probability of being selected, *ceteris paribus*, remarkably reduces over time, probably as effect of the already mentioned stronger budget constraint.

The binomial model, however, does not use all the available information as it does not consider that among funded projects there are cases that have been selected on a purely scientific basis. This additional information may be useful to better identify those factors additional to scientific evaluation that eventually decide about funding. Tables 3 and 4 report the estimates of the multinomial Probit and the ordered Logit, respectively. In the first case only marginal effects are reported,[14] as in multinomial models coefficients can not be directly interpreted as changes of the *j*-th option probability in response to changes of the independent variable. On the contrary, marginal effects do indicate the change in the probability of the different options such that these probabilities continue to sum up to unity (Cameron and Trivedi, 2005).

According to the Probit model, a higher score significantly increases the probability of a project to be funded (*j=2*), while reduces, at the same time, the probability associated to the other two choices. The scientific evaluation, therefore, affects both stages of selection but, as mentioned, mostly separates the unselected projects from those selected and funded. The result of the binomial Logit is also confirmed for what concerns the cost of the project and the presence of an ORD, as both are significant and positively affect the probability of a project to be funded. The unit cost, however, does not seem to affect very much the probability of a selected project to be eventually funded, while, on the contrary, the presence of an ORD substantially reduces the probability that a selected project is not funded.

Duration shows a significant and positive effect on *j=1*, while it is not significant for *j=0* and *j=2*. In both these cases, however, it shows a negative sign: beside the scientific merit, duration encourages selection but discourages actual funding as, evidently, it is seen as a factor that increases overall financial burden and outcome uncertainty. It seems to be the complement to the score and, to a lesser extent, to the cost variables: they primarily drive the selection while duration and ORD, though working in opposite directions, mostly influence the final choice about funding. Time dummies behave similarly as, when significant, they negatively influence the probability of the project to be funded (*j=2*) but not to be selected (*j=1*). This would suggest that the increasing financial constraint over the years does not affect project selection but only decision on actual funding[15].

Finally, only the dummy relative to "farm management and rural development" is significant among sectoral dummies for all the possible alternatives. Under this sector, it is less likely for a project to be selected and funded. A similar condition, though with lower significance, also applies to "livestock" projects while results confirm a preference given to the "environment" projects both in scientific selection and funding. With ordered Logit (Table 4)[16], all the quali-quantitative information is used. Estimated coefficients and marginal effects confirm. Evidence about score, cost and presence of an ORD. Also project duration confirms previous results but in this case respective parameter is not

[14] Multinomial Probit estimation is performed by taking choice *j=0* as reference; estimated coefficients, therefore, should be interpreted accordingly.

[15] Data prove that the number of funded projects gradually decreases over the time (from 142 projects funded in 2001 to 70, in 2006), as well as the total volume of funds granted (Materia and Esposti, 2009).

[16] Even in this case, we also estimated the ordered Probit model, but results do not differ substantially.

statistically significant. Many sectoral and time dummies lose statistical significance compared to previous specifications. The only significant time dummies concern years 2003 and 2004, still confirming the interpretation of an increasing budget constraint. Finally, no sectoral dummy is significant except the "farm and rural development" sector which confirms lower probability, *ceteris paribus*, of both of selection and funding.

Across alternative specifications empirical results confirm that, beyond the scientific merit, other factors are relevant, and sometimes even to a greater extent, as determinants of both selection and funding. In this respect, however, two major questions remain open. On the one hand, it should be assessed to what extent additional criteria overlapping the scientific merit may represent an element of lower transparency and, therefore, greater information asymmetry and uncertainty to the detriment of the proponents (researchers), making the competitive mechanism less rational. On the other hand, and consequently, doubts may be raised on whether and how this induces strategic behaviour by the researchers themselves like adverse self-selection or preparation of projects that does persuade the funding institution to a higher selection propensity but without a real higher scientific merit, thus making the characteristics of the projects themselves endogenous to the selection process. On these aspects, further theoretical analysis and empirical tests may be helpful.

Table 1 - Variables adopted in empirical investigation and their link with the theoretical model

Variable	Description	Unit of measure	Corresponding model parameter
SCORE	Peer-reviewers evaluation	*Scores*	-
COST	Project unit cost (per month)	*Thousands Euros/Month*	C_i - project cost
MONTH	Project duration	*Months*	e_i - project effort
ORD	ORD proposing	*Dummy (0= no, 1=yes)*	θ_i - skill/reliability
SEC_L	Sector: Livestock	*Dummy*	
SEC_RD	Sector: Rural development	*Dummy*	
SEC_E	Sector: Environment	*Dummy*	
D_02	Year: 2002	*Dummy*	B_i - budget constraint
D_03	Year: 2003	*Dummy*	
D_04	Year: 2004	*Dummy*	
D_05	Year: 2005	*Dummy*	
D_06	Year: 2006	*Dummy*	

Table 2 - Binomial Logit estimates- standard errors in parenthesis

Variable	*Coefficient*		*Marginal effect (dy/dx)*		*Variable*	*Coefficient*		*Marginal effect (dy/dx)*	
SCORE	1,667	**	0,413	**	SEC_RD	-0,533	**	-0,128	**
	(0,125)		(0,030)			(0,219)		(0,050)	
COST	0,135	*	0,033	*	D_02	-0,266		-0,065	
	(0,072)		(0,018)			(0,223)		(0,054)	
MONTH	-0,089		-0,022		D_03	-0,957	**	-0,222	**
	(0,070)		(0,017)			(0,222)		(0,046)	
ORD	0,636	**	0,158	**	D_04	-0,606	*	-0,145	**
	(0,147)		(0,036)			(0,225)		(0,051)	
SEC_L	0,048		0,012		D_05	-0,167		-0,041	
	(0,172)		(0,043)			(0,241)		(0,060)	
SEC_E	0,590	*	0,146	*	D_06	-0,715	**	-0,169	**
	(0,339)		(0,082)			(0,226)		(0,049)	
SEC_RD	-0,533	**	-0,128	**	CONSTANT	0,105		-	
	(0,219)		(0,050)			(0,170)		-	
Pseudo R^2: 0,219									

**,* denote statistical significance at 5% and 10% confidence level, respectively

Table 3 - Multinomial Probit estimated marginal effects (dy/dx) - standard errors in parenthesis

Variable	*j=0*		*j=1*		*j=2*		*Variable*	*j=0*		*j=1*		*j=2*	
SCORE	-0,360	**	-0,039	*	0,398	**	SEC_RD	0,249	**	-0,109	**	-0,140	**
	(0,024)		(0,021)		(0,028)			(0,054)		(0,039)		(0,050)	
COST	-0,028	*	-0,012		0,040	**	D_02	0,013		0,056		-0,069	
	(0,014)		(0,018)		(0,018)			(0,047)		(0,055)		(0,055)	
MONTH	-0,015		0,035	**	-0,020		D_03	-0,009		0,238	**	-0,229	**
	(0,015)		(0,015)		(0,017)			(0,044)		(0,054)		(0,047)	
ORD	-0,052	*	-0,095	**	0,148	**	D_04	-0,009		0,177	**	-0,168	**
	(0,030)		(0,029)		(0,035)			(0,045)		(0,056)		(0,051)	
SEC_L	0,087	**	-0,082	**	-0,005		D_05	-0,155	**	0,216	**	-0,061	
	(0,040)		(0,033)		(0,042)			(0,036)		(0,062)		(0,060)	
SEC_E	-0,010		-0,136	**	0,146	*	D_06	-0,192	**	0,382	**	-0,190	**
	(0,070)		(0,057)		(0,082)			(0,030)		(0,055)		(0,051)	

**,* denote statistical significance at 5% and 10% confidence level, respectively

Table 4 - Ordered Logit estimates - standard errors in parenthesis

Variable	*Coefficient*		*Marginal effect (dy/dx)*					
			j=0		*j=1*		*j=2*	
SCORE	1,888	**	-0,320	**	-0,146	**	0,467	**
	(0,112)		(0,022)		(0,020)		(0,029)	
COST	0,120	*	-0,020	*	-0,001	*	0,030	*
	(0,067)		(0,011)		(0,005)		(0,017)	
MONTH	-0,018		0,003		0,001		-0,004	
	(0,063)		(0,011)		(0,005)		(0,156)	
ORD	0,537	**	-0,086	**	-0,047	**	0,133	**
	(0,135)		(0,020)		(0,014)		(0,033)	
SEC_L	-0,101		0,017		0,007		-0,024	
	(0,156)		(0,027)		(0,011)		(0,038)	
SEC_E	0,330		-0,051		-0,031		0,082	
	(0,313)		(0,044)		(0,034)		(0,078)	
SEC_RD	-0,870	**	0,172	**	0,028	**	-0,200	**
	(0,198)		(0,044)		(0,009)		(0,040)	
D_02	-0,200		0,035		0,014		-0,050	
	(0,211)		(0,038)		(0,013)		(0,051)	
D_03	-0,701	**	0,133	**	0,033	**	-0,166	**
	(0,204)		(0,042)		(0,007)		(0,045)	
D_04	-0,340		0,061		0,021	**	-0,083	*
	(0,209)		(0,040)		(0,010)		(0,049)	
D_05	0,165		-0,270		-0,014		0,041	
	(0,222)		(0,035)		(0,020)		(0,055)	
D_06	-0,157		0,027		0,011		-0,038	
	(0,203)		(0,036)		(0,013)		(0,049)	
CONST_1[17]	-1,471	(0,170)**		CONST_2	0,029	(0,161)**		
Pseudo R^2:	0,219							

**,* denote statistical significance at 5% and 10% confidence level, respectively

[17] In the multinomial specifications these constant terms should be interpreted as threshold values of the latent variable that discriminates between the different options (Cameron and Trivedi, 2005). With three possible options, there are two threshold values: one for the passage from "unselected" projects to "selected but not funded" ones; the second from the latter to the "selected and financed" projects. Note that the first constant assumes a negative value because of the standardization made on independent variables. In addition, the usual test of statistical significance on these parameters is of little relevance. It is more useful to test whether these parameters are statistically different or not. Taking into account the estimated standard errors, the outcome of this test clearly shows that the two thresholds are different, confirming the real distinction of the three options.

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DEVELOPMENT OF SMES IN AGRIBUSINESS OF VOJVODINA COMMUNES - STATE AND PERSPECTIVES[1]

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Abstract

Agriculture as the economic sector is an important factor of economic development of Serbia and an important part of economic structure. Serbia has agrarian resources (land, climate and water) that are not used enough, and therefore, represent a significant economic potential for further development. Vojvodina is the best-developed economic region of the Republic of Serbia, with dominant role of agricultural production. The main economic potential of Vojvodina development is, among other things, the strengthening and improvement of agriculture in the private sector. Economic potential of agriculture impose the need to analyze this situation in the field of small and medium sized entrepreneurship as the bearer of the future development of agriculture in Vojvodina. Cluster analysis is a method that will determine how to group communes in Vojvodina according to the level of development of small and medium-sized enterprises in the field of agriculture, and thus get an insight into the current state of development of this sector of agriculture, as well as point out the possibilities for the future development of SMEs in agribusiness of Vojvodina.

Key words: agricultural production, small and medium sized enterprises (SMEs), clusters analysis, clustering of communes in Vojvodina.

Introduction

Increase in volume of production, the optimal use of agricultural resources, the creation of a stable food market, the achievement of greater level of productivity, increase the competitiveness of agricultural products and implementation of integrated agricultural and rural development are the strategic objectives of the development of Vojvodina agriculture. Small and medium sized enterprises in agribusiness have an important role in the realization of these goals. Favorable natural conditions as well as tradition in the production and processing of agricultural products, a relatively favorable geographic position, qualified and relatively cheap workforce, good transport infrastructure, as well as a relatively unpolluted environment, are just some of the stimulating factors for the development of small and medium sized enterprises in Vojvodina.

Although Vojvodina is a part of Serbia with the most developed small and medium-sized entrepreneurship (Popović and Maletić, 2008) in the field of agribusiness, it is also very important to determine the inter-regional development of this sector of agriculture. Cluster analysis was performed in order to determine grouping of Vojvodina communes according to level of development of SMEs in the agriculture. Based on three-year average (2004-2006 yr.), the following data were determined for all communes in Vojvodina: total income, permanent assets, working capital, total profit, loss, number of enterprises and number of employees.

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Based on matrix data (45x7), the matrix of ties is formed (45x45), and Euclidian distance is used as a measure of distance.

$$d_{ij} = \sqrt{\sum_{k=1}^{p} (x_{ik} - x_{jk})^2}$$

Next, clustering of communes in the clusters (groups), according to the level of development of SMEs in the agriculture, was performed by using a method of average linkage.

$$D(O_i, O_j) = \Sigma d_{sl} / n_i \cdot n_j$$

Based on selected indicators, and by applying the square I-distance, the ranking of communes in Vojvodina according to the level of development of SMEs in the agribusiness was carried out.

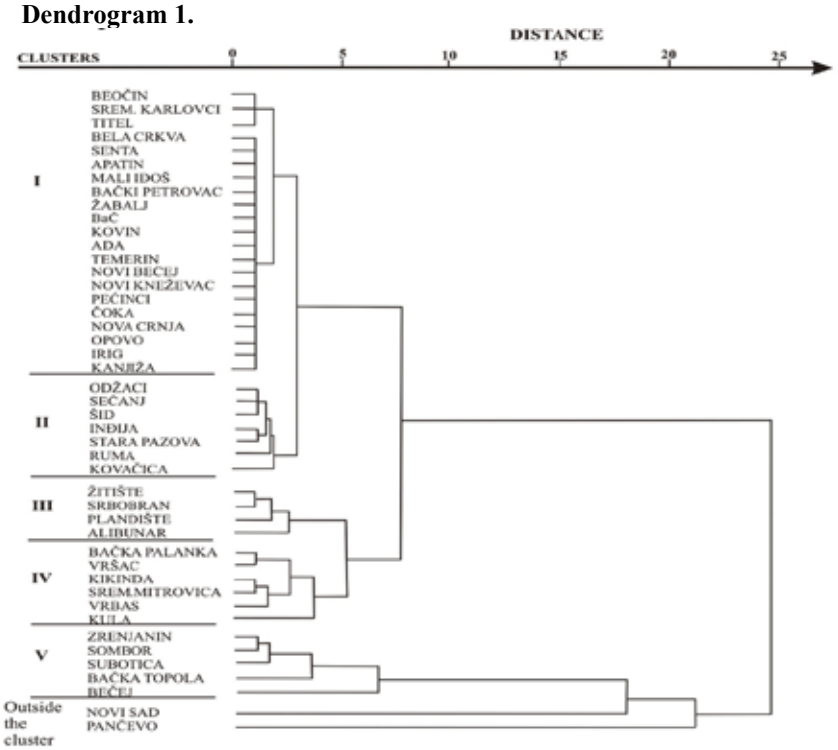
$$D^2 = \sum_{r=1}^{k} \frac{d_i^2}{\delta_i^2} \prod_{j=1}^{j-1} \left(1 - r_{ij;1,2...j-1}^2\right) \qquad d_i = \left| x_{ir} - x_{jr} \right| .$$

Profit is the leading characteristic, and ordering other indicators was found on the basis of correlation coefficient with the leading characteristic.

Results

Based on applied cluster analysis, Vojvodina communes are classified in five clusters (groups), and two other communes are left outside the cluster: Pančevo and Novi Sad (dendrogram 1.)

Dendrogram 1.



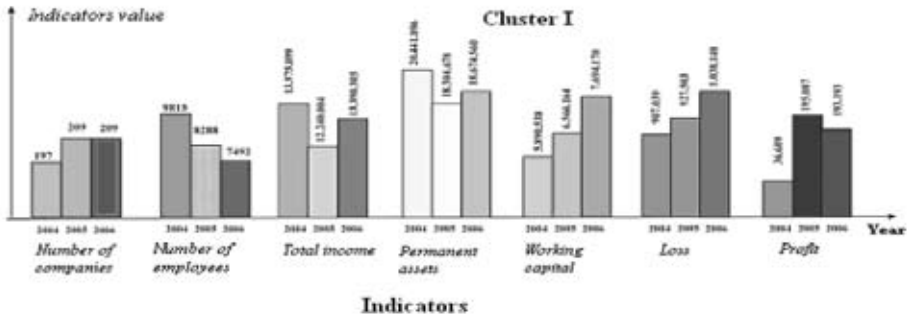
The structure of the observed indicators of the extracted clusters is shown in Table 1.

Table 1 - Indicator structure separated by clusters

Cluster	Total income		Permanent assets		Working capital		Loss		Profit		Number of employees		Number of companies	
	Amount (000 din)	%	Amount (000 din)	%	Amount (000 din)	%	Amount (000 din)	%	Amount (000 din)	%	No.	%	No.	%
I	13201802	16.09	19140378	20.99	6716957	16.57	957563	23.54	141629	7.08	8531.7	21.86	205	21.34
II	10762695	13.12	15778346	17.31	5318650	13.12	399135	9.81	334407	16.72	5270	13.50	134	13.95
III	4532514	5.52	10589632	11.61	2750275	6.79	989994	24.34	82378	4.12	2997.3	7.68	70.3	7.32
IV	16545298	20.17	17487358	19.18	8026191	19.80	743591	18.28	409029	20.45	7108.7	18.21	200.7	20.89
V	22644986	27.60	19118339	20.97	10253382	25.30	794595	19.54	504176	25.21	11106.3	28.46	204.7	21.30
Outside the cluster	14356708	17.50	9058029	9.94	7463155	18.41	182118	4.48	528052	26.41	4014	10.28	146	15.20
total	82044003	100.00	91172081	100.00	40528610	100.00	4066998	100.00	1999674	100.00	39028	100.00	960.7	100.00

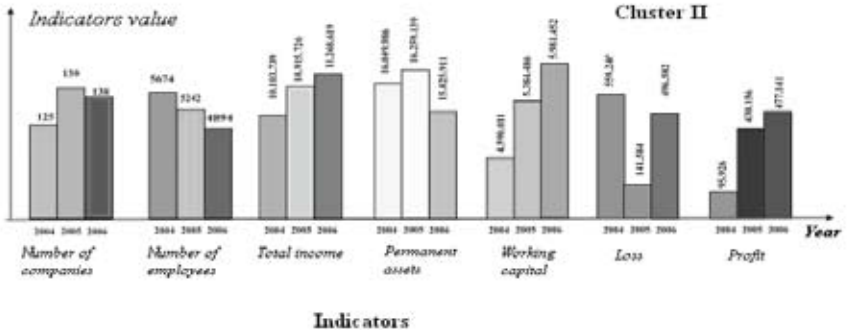
The first separated **cluster** is the largest one and it consists of 21 communes: Beočin, Sremski Karlovci, Opovo, Titel, Kanjiža, Bela Crkva, Senta, Kovin, Mali Iđoš, Bački Petrovac, Žabalj, Apatin, Bač, Ada, Temerin, Novi Bečej, Pećinci, Novi Kneževac, Čoka, Nova Crnja, Irig. Although this cluster includes 47% of all Vojvodina communes, in the structure of the observed indicators of the separated clusters, in the total number of companies, this cluster is involved with only 21.34%, which is similar with number of employees (21.86%), while in total, get involved with only 7.08%. The returns by the municipality from this sector of agriculture is 6 744 279 dinars, which is the lowest amount in comparison with other clusters. The average for the municipality was about 10 companies, and the average number of employees in the SME sector in agriculture by the municipality was 406. Mobility of the selected indicators in the considered period is shown in figure 1, where, among other things, the constant decline of the number of employees and permanent growth of both, working capital and loss is observed.

Figure 1 - The observed indicators in the cluster I



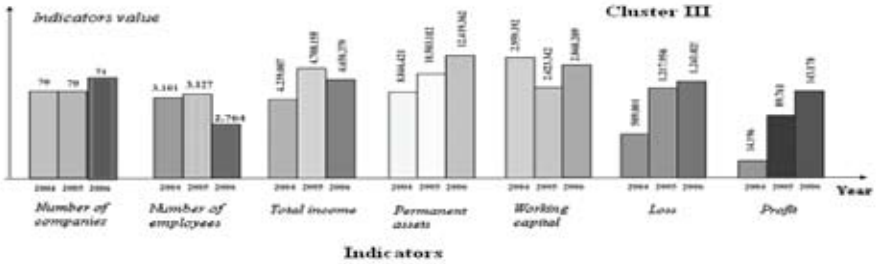
The second cluster includes seven communes: Šid, Stara Pazova, Odžaci, Sečanj, Inđija, Ruma, Kovačica. Characteristics of this cluster are the following: the average per municipality is 19 SMEs engaged in agricultural production, with about 750 employees by the municipality. Although there are only seven communes, this cluster participated in the total profit with 16.72%. Characteristics of this cluster are constant decrease in number of employees, and increase in total revenue, assets and profit (Figure 2). In the observed period, average profit by municipality was 47 772 500 dinars, which is significantly better than the results of previous cluster.

Figure 2 - The observed indicators in the cluster II



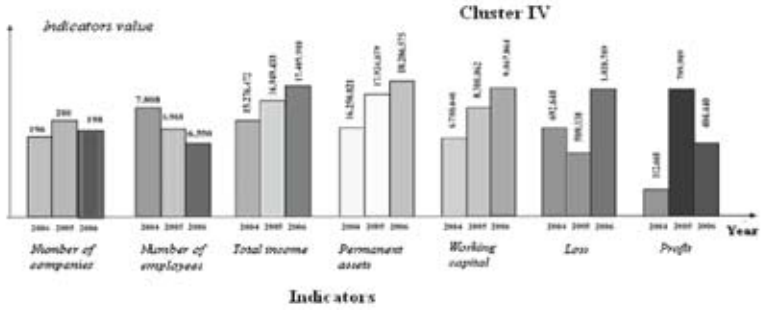
The third cluster is the cluster with the smallest number of selected communes: Plandište, Žitište, Srbobran, Alibunar. There were approximately 17 companies and 749 employees by municipality from SMEs sector in the agriculture. What separates this cluster from the others is very high participation in the total loss, and in the structure of all the clusters it is 24.34%. These four communes make almost one quarter of loss that is realized in the SME sector in Vojvodina. Presence of this cluster in total profit is the lowest and is only 4.21%, or 20 594 660 dinars by the municipality. Mobility of selected indicators in the considered period is shown in Figure 3.

Figure 3 - The observed indicators in the cluster III



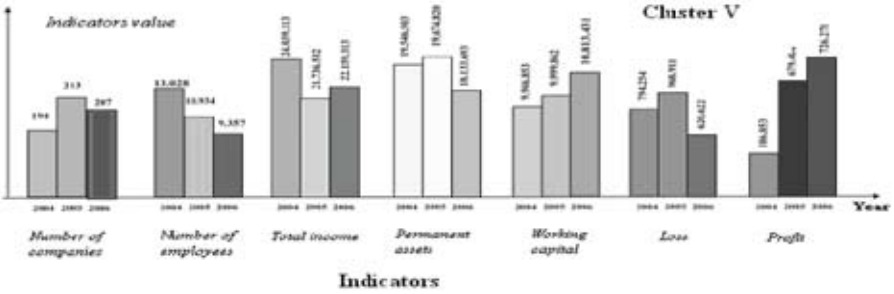
The fourth cluster includes six communes: Kikinda, Sremska Mitrovica, Vrbas, Bačka Palanka, Vršac, Kula. This cluster is characterized by a considerably greater number of companies by the municipality in comparison with the previous three clusters (in average 33), as well as the considerably greater number of employees by the municipality from this sector of agriculture, which in average is 1185 employees. The values of the examined indicators in the fourth cluster are displayed in Figure 4.

Figure 4 - The observed indicators in the cluster IV



The fifth cluster consists of five communes: Zrenjanin, Sombor, Subotica, Bačka Topola, Bečej. The average in this cluster was 41 companies with 2,221 employees, by municipality, from SMEs sector in the agriculture. Characteristics of this group of communes are constant decrease in the number of employees, but also increase of returns (Figure 5).

Figure 5 - The observed indicators in the cluster V



This cluster has the highest representation in almost all indicators, except in the realized losses and profit. Communes that are outside the cluster achieved greater participation in the realized profit, but this group of communes has achieved average annual income by the municipality in an amount of 100 835 200 dinars, which exceeds all the other clusters and classify this communes in the group with the best business results.

Outside the cluster, or outside the defined homogeneous group, are communes of Novi Sad and Pančevo. First, we are talking about the large communes that have a significant capacity for agricultural production and are located near the great consumer centers. After all, they represent one of them. They have well-established road network, which also contributed to classify them as communes with the most developed sector of small and medium sized entrepreneurship in the agricultural production in Vojvodina. In the observed period, in the municipality of Novi Sad, the average was 114 companies with 1,956 employees, and average annual profit of 189 260 400 dinars was achieved at the level of the municipality. In the municipality of Pančevo there was smaller number of companies, or 32 of them, with a higher number of employees, i.e. 2058, and average annual profit of 338 792 000 dinars, which is the highest profit achieved by the municipality in Vojvodina. Although Vojvodina is a region with the most developed SME in the field of agriculture in the Republic of Serbia (Popović and Maletić, 2008), there is inequality within inter-regional development of SME. The main concentration of SMEs in this sector of economy is in the large urban communes (Pančevo, Novi Sad, Subotica, Sombor, Zrenjanin and Bečej). First, these are communes with very favorable conditions for agricultural production, and after all, represent great consumer centers. This is also the area that is situated on the crossroads of the most important main roads and borders with four countries: Romania, Hungary, Croatia and Bosnia and Herzegovina. Water traffic in this area is also very developed. Favorable transport infrastructure facilitates marketing of agricultural products and stimulates the development of SMEs. Private entrepreneurship has a long tradition, so, communes have experience with stimulating private investment. The presence of financial institutions allows greater availability to necessary investment capital. Greater activity of advisory services as well as better availability of necessary information is noted, which classified these communes as the communes with the most developed SMEs in the field of agriculture in the region of Vojvodina.

Discrimination analysis was performed for ranking Vojvodina communes according to the level of development of SMEs in agriculture. For the assessment of rating development level and for ranking communes special parameters were used. Each of them, in a special way, measured the level of development, but also has complementary character. In that way,

development level of each municipality may be evaluated. Total income (x_1), permanent assets (x_2), working capital (x_3), loss (x_4), total profit (x_5), number of employees (x_6) and number of companies (x_7) are indicators that were used to define values of I-distance for each municipality. Observed indicators are defined based on three-year average (period 2004-2006) for each municipality in the Vojvodina. Basic statistical data for the observed indicators are shown in Table 2.

Table 2 - Descriptive statistics

Indicators	Min. value	Max. value	Arithmetical mean	Standard deviation	Coefficient of variation (%)
Total income (000) din	12710.96	7428895	1823200	1793098	98.34893
Permanent assets (000) din	76967.27	5641498	2026046	1361449	67.19735
Working capital (000) din	5233.33	4250960	900635.8	870849.7	96.69277
Loss (000) din	1842.582	286797.7	90377.74	75067.9	83.06016
Profit (000) din	0	338792	44437.2	65880.37	148.255
Number of employees	16	2661.333	866.6333	659.3404	76.08067
Number of companies	1.333333	114	21.33704	19.64407	92.0656

High values of coefficients of variation point out to a very inhomogeneous data series. The highest dispersion in the data is within the profit, and then in the following characteristics: total income, working capital, the number of companies, etc... Both, indicator characteristics and their order of significance are important for the result of discrimination analysis. Therefore, profit was taken as the leading feature, and the order of other characteristics is determined by the correlation matrix.

The model first entered the leading feature - profit (x_5), and then the following: working capital (x_3), total income (x_1), permanent assets (x_2), number of employees (x_6), number of companies (x_7) and loss (x_4). Ranking list of communes in Vojvodina, according to level of development of SMEs, was obtained by applying a square I – distance. It is shown in table 3.

Table 3 - Ranking list of communes in Vojvodina

Rang	Opština
1.	Pančevo
2.	Novi Sad
3.	Sombor
4.	Bačka Topola
5.	Kula
6.	Zrenjanin
7.	Subotica
8.	Srbobran
9.	Žitište
10.	Alibunar
11.	Kikinda
12.	Kovačica
13.	Sremska.Mitrovica
14.	Plandište
15.	Bačka Palanka

Rang	Opština
16.	Vršac
17.	Ruma
18.	Vrbas
19.	Bečej
20.	Novi Bečej
21.	Inđija
22.	Odžaci
23.	Šid
24.	Sečanj
25.	Stara Pazova
26.	Temerin
27.	Ada
28.	Žabalj
29.	Irig
30.	Nova Crnja

Rang	
31.	Bački Petrovac
32.	Kanjiža
33.	Apatin
34.	Mali Iđoš
35.	Pećinci
36.	Čoka
37.	Kovin
38.	Bač
39.	Senta
40.	Opovo
41.	Novi Kneževac
42.	Bela Crkva
43.	Titel
44.	Sremski Karlovci
45.	Beočin

Discrimination analysis confirmed the results of cluster analysis and provided a better insight in the level of development of SMEs in the communes of Vojvodina, but also the order of the municipality according to the development.

Conclusion

The main economic development potentials of Vojvodina are in strengthening and improvement of agriculture in the private sector, improving the food industry and in development of tourism and trade. Vojvodina, with its agricultural production and potentials, has significant advantages to sell its own quality products on greater and more profitable markets. Economic development of Serbia, and also Vojvodina, must be based on the recognition of private ownership and market economy, from the standpoint of a more favorable and more efficient environment for direct foreign investment and the development of SMEs in the field of agriculture. There is a great competition on domestic and foreign markets in a placement of agricultural and food products and only high quality products with specific source and geographical origin have greater export opportunities. Potential development programs of SMEs in agribusiness should be related to the organic way of production in livestock breeding (meat, milk, and products), vegetable crops and fruit growing (fresh and refined products), as well as for products that are produced in traditional ways. SME should be also direct to the production of vegetables in greenhouses and hothouses with the use of geothermal energy sources whose presence is in the area of Vojvodina very significant, but unused. Production and processing of quality species of fish, a wide range of products that can be obtained by processing corn, as well as the production of biodiesel (from harvest remains, oilseed rape, sunflower and corn) are also potential opportunities for the development of SMEs. These are just some of the products that represent the opportunity for the promotion of SMEs in the domestic and international market. Development of SMEs in agribusiness of Vojvodina would enable better utilization of agricultural resources, prevent departure of young people from the village, make opportunities for their employment, and, in the end, would come to stronger inter-regional and balanced development of the province of Vojvodina.

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MULTIFUNCTIONAL AGRICULTURE AS AN INNOVATION PATH FOR RURAL AREAS

Lívia Madureira[1], Susete Costa[2]

Abstract

The main purpose of this paper is to discuss the potential of MFA model to enhance innovation in rural areas build on the analysis of information from a database of best practices on innovation in EU rural areas collected by the RAPIDO project[3]. The analysis shows innovation to be strongly related to multiple-activity. This suggests the synergies between functions and land-uses to overlap the competition for resources between activities and that MFA shows a promising approach to enhance innovation in rural areas.

Key words: Innovation, Multifunctionality, Rural areas, Sustainability.

1. Introduction

Multifunctionality of agriculture (MFA) has been acknowledged in the last years, both by scientists and politicians, as a promising approach to address sustainable development within rural areas. The synergies between productive activities and environmental functions and services have been encouraged since 1992 by the EU agro-environmental policy. In addition, rural development programmes and policies have promoted the MFA model build on its social dimension and its potential to enhance on-farm diversification strategies. This public support to the MFA was accordingly to the consumers and societal demands for food quality and safety, recreation and environmental quality.

As a result of market and societal demand drivers and the stimulus of EU domestic policies there has been, within the last decade, a reinforcement of the on-farm diversification strategies build on the advantages of specific-location features to the development of new products and services. An interesting outcome of these strategies is the emergence of a multiple output land-based supply, evidencing the multifunctionality as a promising innovation path for rural areas.

The role of innovation and knowledge to promote sustainable development in the EU rural areas is acknowledged, at some extent, by the rural development strategy for 2007-2013 (EC, 2005). However, this latter strategy is built on a sectoral vision, focusing its attention into the promotion of innovation and knowledge within the "conventional" rural sectors, agriculture, forestry and food industry. It assigns a secondary position to the multifunctional and multi-sectoral activities, whereas acknowledging its importance.

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3 RAPIDO – Rural Areas, People & Innovative Development. SSPE-CT-2006-44264. Detailed information available on www.rapido-fp6.eu.

The dominance of a technological and sector-oriented paradigm for innovation, following the OECD definitions and methodologies to measure innovations (OECD, 1997 and 2005), explains why the rural areas are widely excluded, both from the study and the implementation of targeted innovation plans or programmes, which address basically the sectors with global competitiveness potential. Therefore, though EC (CEC, 2003) defines innovation as "the successful production, assimilation and exploitation of novelty in the economic and social spheres" and recognises, in a subsequent communication (CEC, 2006), that all forms of innovation need to be promoted, for innovation comes in many forms others than technological innovation, including organisational innovation and innovation in services", this broad definition still has not turned operational for other scales than the firm/sectoral ones.

Innovation taking place in the EU rural areas is characterised by a diversity of innovation types and actors and by minimal innovation often build on tacit know-how and supported on informal networks (RAPIDO, 2009). Another important feature of innovation in EU rural areas is that is frequently undertaken by rural enterprises with multiple activities and involved all along the value chain. The plasticity shown by the "rural innovators", while convergent with the diversification strategies promoted by rural development policy, is not captured by the conventional support schemes to agriculture and rural development. The gap between "rural innovators" dynamics and the public policies supporting competitiveness and rural development evidences the importance of a better understanding of the motivations and strategies of rural enterprises and other organisations in order to build the knowledge needed to adjust the public support and to turn it successful in promoting innovation in rural areas.

This paper provides a contribution to fill the knowledge gap on the innovation taking place within EU rural areas and on how it could be enhanced. The paper builds on data and findings of the RAPIDO project[4], and its objectives are two folded. First to characterise innovation in rural areas build on the analysis of a number of case-studies of innovative initiatives located across different regions of UE. This characterisation includes variables such as the type of promoter, sector(s) where it operates and type of innovation undertaken. Emergent activities related to innovation, such as environment-related activities, are examined as well its interactions with more conventional activities of rural organisations. Secondly, the multiple-activity dimension of innovative organisations is analysed within the framework of MFA to support a discussion on the potential of the multifunctionality model to enhance innovation in EU rural areas.

The paper is organised as follows. The next section provides empirical evidence on some features of the innovation taking place in the EU rural areas. Section 3 analyses the multiple-activity strategies of innovative organisations within the framework of MFA and discusses the potential of MFA model as an innovation path for EU rural areas. Finally, section 4 provides some concluding remarks.

2. Evidence on innovation in EU rural areas

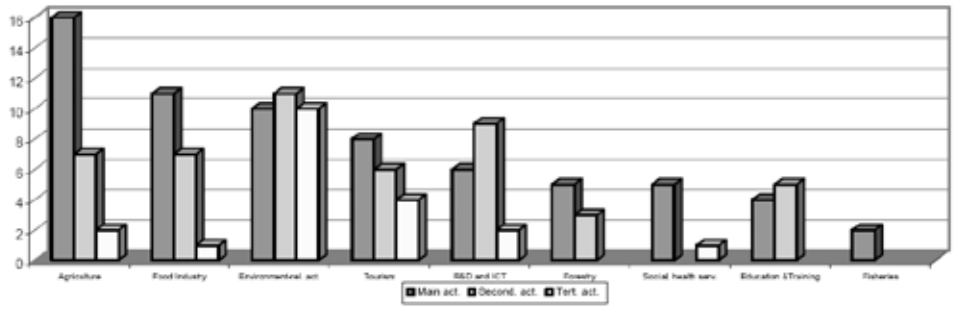
The empirical evidence presented and discussed within this section is based on the responses to a survey conducted at case study level. Data where collected by the RAPIDO project (2007-2008) and consists on a database of best practices on innovation in EU rural areas, with 67 case studies spread all over 17 EU countries. This database includes a diversified set of information, such as the sectors of activity, type of innovations, the promoters of the initiatives and socio-economic impacts of the innovation (RAPIDO, 2007). The information presented in this section addresses three main questions: Which are the innovative sectors? Who are the innovators? And, what types of innovation have been undertaken?

4 The main objective of this project was to analyse current best practices of innovation in agriculture, forestry, the food sector and the wider rural areas as well as to analyse methods to transfer knowledge to different target groups.

2.1 Which are the most innovative sectors?

The RAPIDO database shows innovative organisations to be concentrate within the conventional rural sector's, agriculture, food industry and tourism, reflecting the relative weight of these sectors in the EU rural economies (see Figure 1).

Figure 1 - Innovative initiatives by activity sector, including secondary and tertiary activities



Source: RAPIDO, 2008

Figure 1 shows that the conventional rural sectors, agriculture, food industry, tourism and forestry, appear mainly as the main activity of the organisation. However, all of these activities show to be also relevant as secondary activities and even as tertiary for others organisations.

The environment-related activities, which include activities such as bio energy, landscape management, nature and biodiversity conservation and environmental education, presents a similar importance as main or complementary activity for the organisation. It is the more expressive sector appearing as second and third activity. Renewable energy production, meaning bio energy with one exception (photovoltaic), represents 70% (7 of 10 case studies) of the case studies where these activities are the main activity. Renewable energy production shows to be less important as secondary or tertiary activity (4 of 21 case studies) (RAPIDO, 2008). The high proportion of activities related to the environment appears as a surprising finding, in particularly its importance as secondary and tertiary non productive activities.

Research and development (R&D) and information and communication technologies (ICT) reveal to be significant activities for the surveyed organisations. They are reported as the primary activity for a number of case studies, but mostly projects with supra-regional scope. Even so, while less important as the main activity compared to the conventional rural sectors and environment-related activities, they represent a relevant sector as a secondary activity.

Yet, probably the most surprising finding is the weight of multiple-sectoral organisations: 70% of the innovative initiatives have a secondary activity and 30% have a third one. Further, there are a significant number of organisations that integrate within its values chain activities of the three major economic sectors (agriculture, industry and services).

To sum up, and answering the question "which are the sectors showing to be more innovative" there is four aspects to underline. The first is that both "traditional" and "emergent" rural sectors show to be innovative. Secondly more than sectoral innovation we see multi-sectoral innovative organisations. A third remark is the growing importance of the environment-related activities in particular associated with the conventional rural activities, agriculture, forestry and tourism. Environment-related activities emerge as new sector calling for a space of its own within the economic activities nomenclature. Finally, it is important to report the weight of R&D and ICT activities, in particular

as complementary activities of both conventional and emergent sectors.

2.2 Who are the innovators?

The innovators include mostly private organisations, such as service providers, producers, private investors and tourism operators. Table 1 shows the nature of innovators, highlighting the importance of private organisations: two in each three case studies. Public agents account for less than 20% of total innovators, yet their importance increases when considered they subsume into the "association of categories".

Table 1 - Actors implementing the innovation

Type of actors	**No**	**%**
Service providers	15	22.7
Producers	13	19.7
Private investors	10	15.2
Tourism operators	5	7.6
Residents	4	6.1
Governmental bodies	8	12.1
Local authorities	4	6.1
Association of categories	7	10.6
Total	66	100.0

Source: RAPIDO, 2008

Another related question is "where innovation is taking place? The database provides information for 53.7% of the case studies. Yet, the majority of them (83.3%) locate its activities within lagging/peripheral rural areas (RAPIDO, 2008). These figures seem to confirm the findings presented in the literature, that a peripheral location might encourages innovation (e.g. Patterson et al. 2003, North and Smallbone 2000). Further, the importance of lagged/peripheral areas within the sample explains, probably, the relevance observed for the environment-related activities.

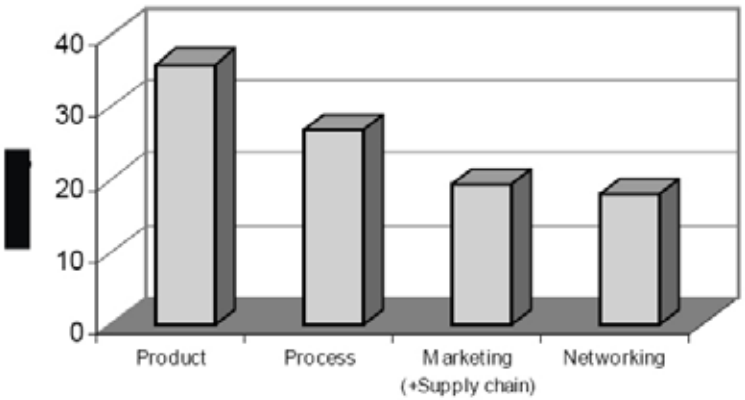
These results highlight the importance of the location-specific factors (SERA, 2006) to the development of innovative products and to the diversity of activities undertaken by the majority of the innovative rural organisations. They suggest also that these locations favour innovation through multifunctionality to respond consumers and social demands for environmental quality, food safety and leisure.

2.3 What types of innovation are being undertaken?

The principal type of innovation implemented according to the organisations surveyed[5] is displayed in the Figure 2. It shows product innovation as the most important for around 35% of the case studies. Process innovation comes in second place, reported as the main innovation type implemented by more than 25% of the organisations surveyed. Marketing (chain supply) and networking have globally a relevant weight (37.3% of the total case studies) (RAPIDO, 2007).

5 Note that the respondents reported only the principal type of innovation developed/implemented for the main activity.

Figure 2 - Main type of innovation



Source: RAPIDO, 2008

These figures show, that in spite of reporting only the main type of innovation undertaken, the importance of organisational innovation is quite relevant, certainly needing to be object of an especial focus within the innovation analysis in the rural areas.

3. Multiple-activity strategies and the MFA model

This section analyses the multiple-activity strategies observed for the innovative rural organisations within the framework of concepts and models of MFA, in order to discuss the potential of a multifunctionality model as an innovation path for EU rural areas. It starts with a brief review of the MFA framework, which is used next to analyse the empirical evidence on the multiple-activity strategies of innovative rural organisations. The third part of this section is dedicated to discuss the potential of multifunctionality model to enhance innovation in EU rural areas.

3.1 Concepts and approaches to MFA

There are different conceptual approaches to MFA, namely the conventional distinction between demand and supply sides (Van Huylenbroeck et al. 2007). Supply approach envisages MFA as a technical issue related to the ability of agriculture to provide multiple joint outputs; whereas, demand approach sees MFA as a societal demand, therefore as a "duty" of agriculture to supply a diversified bundle of outputs to society, including public goods and positive externalities. These alternative approaches are somewhat linked by a third view which sees multifunctionality in a broader sense and as framework for a new agro-food and rural development model (Van der Ploeg and Roep 2003, Van Huylenbroeck et al. 2007, Renting et al. 2009).

While supply and demand approaches to MFA appear as dichotomous views of the same phenomena, this situation only holds when non-commodity outputs are jointly produced without representing an additional cost to the producers. The current situation in most of EU rural areas is that, on one hand, negative externalities and public bads of agriculture became "joint products" unaccepted by the society and, on the other hand, the positive externalities and public goods jointly produced with food/fibre production became scarce to respond to an increasingly demand for environmental quality, food safety and leisure. Therefore, priceless joint products of agriculture, such as waste or landscape become priced outputs. This pricing has been done through the environmental and agro-environmental policies of EU. The agro-environmental grants are the most well known measures of the latter policy, and are basically payments to avoid/encourage negative/positive externalities of farm activities. These green payments, launched by the EC in 1992, were in a certain way the first

acknowledgement of the MFA of European farmers, built on the demand/normative side concept of MFA.

The synergies between productive activities and environmental functions have been encouraged in EU since then. Therefore, it was not surprising the importance given to the MFA under the Agenda 2000, linking it with the sustainability concept on the rural development policy ground. In addition, within the later years, rural development programmes and policies have promoted the MFA model build on its social dimension and its potential to enhance on-farm diversification strategies. These programmes and policies build on the MFA, whereas implicitly, as a new agro-food and rural development model which overlaps supply and demand approach to MFA by focusing on the local capture of the value of both market and non-market goods and services. Another issue when one tries to relate MFA with multiple-activity is the distinction between concepts such as multifunctionality, diversification and pluri-activity. Van Huylenbroeck et al. (2007) define as multifunctional an activity with multiple outputs, whereas diversification means the combination of different economic activities into the same management unit and pluri-activity refers to multiple activities of the farmer or rural entrepreneur. Therefore, it is important to analyse the multiple-activity strategies of the innovative organisations surveyed within this framework to have a better understanding of what is the meaning of the multifunctionality for them.

3.2 Multiple-activity: diversification strategies and multifunctionality

Table 2 relates the main activity of the surveyed organisations with their complementary activities (up to the third activity).

Table 2 - Innovative initiatives by main and complementary activities

Main activity	Secondary and third activity					
	Agriculture	Food Ind.	Forestry	Tourism	Env. Act.	RD, ICT
Agriculture		7	1	2	9	1
Food Industry	3			2		4
Forestry		2			2	1
Tourism	1		1		2	
Environ.-rel. activ.	3		1	1	4	
R&D and ICT	1				1	2
Total	8	9	3	5	18	8

Source: RAPIDO database, 2007

Agriculture appears significantly related with food industry and the environment-related activities. It comes also associated with forestry and tourism. The food industry appears together with activities such as agriculture and tourism, whereas the ICT and R&D appear as the most relevant complementary activity. Forestry comes up related with the environment-related activities and also with food industry. Tourism presents complementarities with agriculture, forestry and the environment-related activities. Environment-related activities appear strongly linked to agriculture and also with forestry and tourism. Further, some organisations reported it as complementary activities when they are also the main activity. This situation reflects the bundling of quite different activities such as bio energy, nature conservation or environmental education. These two later activities like other, such as landscape management, are mostly joint activities.

The data confirm multiple-activity pattern as corresponding also to a combination of multi-sectoral activities. This suggests that multiple-activity strategies are mainly diversification strategies, meaning a set of different economic activities managed by the same unit (Van

Huylenbroeck et al. 2007). Yet, a closer look to this multiple-activity pattern evidences its joint character, activities that share resources to supply a common product: a special product or a basket of goods and services.

Some of the combinations and new activities observed within the innovative organisations might be explain as resulting from diversifying strategies in both directions: "deepening activities" (to retain added value) and "broadening activities" (to diversify supply) (Van der Ploeg and Roep 2003, Renting et al. 2009). Yet, often the broadening of activities results from the multifunctionality of land-based activities, such agriculture, forestry and the agro-tourism. The growing importance of the environment-related activities illustrates a striking interaction between multiple-activity and multifunctionality.

The environment-related activities were at begin basically a bundle of non-commodity outputs from land-based conventional rural sectors that farmers (and landowners) were stimulated to provide through the agro-environmental payments. However, they are now became more and more actual activities for many rural organisations. They appear both, as complementary activities of productive sectors, such as agriculture and forestry, or associated to non-productive activities like the tourism.

The greening of European consumers demand (for food and leisure) has converted competitive outputs into complementary products. The "natural" multifunctionality of agriculture and forestry became strategic for activities like the rural tourism, which is increasingly enriching its packages with environment-related services. Therefore, multiple-activity can often be envisaged as multifunctionality strategy from the supply side, with producers offering bundles of outputs resulting from land-based joint activities.

3.3 Multifunctionality as an innovation resource

RAPIDO project (RAPIDO, 2008) concluded that innovation observed in the EU rural areas results at large extent of two (often complementary) strategies: (a) changing land use and/or production processes to answer stimulus from domestic policies (e.g. agro-environmental and biomass incentives); (b) diversifying and developing new activities, products and services to meet consumer's demands (e.g. environment-related and cultural services for tourists). Therefore, domestic policies and market demand have converged to reinforced on-farm diversification strategies and the advantages of specific-location features to develop new products and services and finding niche markets.

The strategies aforementioned drove many farmers and landowners to develop multiple-activity rural business strategies build on the multifunctionality of land-based activities. Some have focused on especial products defined along different activities of the value chain; other, probably the majority, choose to supply multi-output baskets, responding both domestic policies incentives and societal and consumers demand for quality and safe food, leisure and recreation, and landscape and nature conservation. Thus, they have departed from agriculture (and food industry) and enlarge their supply basket to environment-related activities and leisure & recreation. On the other hand, the environment-related activities and its association with tourism (ecotourism and other nature-base tourism forms) seem to attract new-comers to the rural areas. These are entrepreneurs, in particular young and skilled people, whom appear to have inverted the direction of multifunctionality, using it as a resource (a mean) to develop new projects and business where the tourism is often the main activity, although the non-productive environment-related activities are also became increasingly an important sector by its own.

To sum up, the multiple-activity strategies of the innovative organisations whereas can be envisaged as diversification of activities, show in most of the cases a particular character of joint activities organised to supply multi-outputs baskets. This jointly character of the activities emphasises the role of multifunctionality as an asset/resource for innovation strategies, especially involving product, process and market innovation. Therefore, multifunctionality appears clearly as a source of innovation at the organisation level, creating room for new products and process, changes in existing ones and for the opening of new markets.

However, multifunctionality might show even more powerful as an innovation resource if looked at the territorial level. It can be promoted to enhance the development of a multi-output land-based supply at territory level, build on the networking of organisations, which could be encouraged to cooperate in order to supply multi-outputs baskets at the territorial level, through the development of complementary activities, allowing for scale economies and creating room for global competition potential. Therefore, network/organisational innovation appears as a keystone tool to enhance the potential of multifunctionality as an innovation path for rural areas, build on MFA model of joint activities territory-based oriented to respond to a multidimensional demand.

4. Concluding remarks

The evidence available about the innovation taken place in the EU rural areas, whereas still scarce indicates clearly a strong link between the diversification strategies and the multifunctionality of land-based activities. It shows also that innovation in rural areas is mostly the outcome of strategies to overcome constraints, such as a peripheral location and small economic dimension, taking advantage of the uniqueness given by location-specific features and the multifunctionality of land-based activities. Further, it suggests that the synergies between activities and land-uses to overlap the competition for resources between activities within multiple-activity organisations. It shows also that multifunctionality is attracting new-comers, whom are exploiting it as strategic asset within the tourism and the environment-related activities sectors.

This reversal move of entrepreneurs "towards multifunctionality", instead of the former way "from the MFA" of farmers pulled by public policies, while needing to be confirmed as a path for competitiveness, is very promising in terms of coupling triple bottom sustainability goals at individual and territory level. To get a better knowledge of this "new" trend in EU rural areas is fundamental because it would be very helpful to change the traditional view of a dichotomy between competitiveness and social sustainability (implicit within the rural development strategy for 2007-13).

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Poster Session

THE IMPORTANCE OF PROTECTION OF AUTOCHTHONOUS DAIRY PRODUCTS AND POSSIBILITIES TO INCREASE AUTOCHTHONOUS DAIRY PRODUCTS PRODUCTION OBSERVED AS FACTORS IN THE DEVELOPMENT OF THE MUNICIPALITY OF ŠTRPCE[1]

Slavica Arsić, Nataša Kljajić, Mirjana Savić[2]

Abstract

Security situation in Kosovo and Metohija and traffic circumstances - in other words - distance between the municipality of Štrpce and bigger consumer centres in Serbia and other factors restrict milk procession in the existing diary plant and on agricultural husbandries mostly into durable white cheese and cheese brine. The procession of milk into cheese and dairy products with short term durability is significantly less performed, because of the above mentioned reasons.

Within this paper we presented available natural resources and human potential and also did analysis of the development in the number of heads of cattle and the analysis of the quantity of autochthonous dairy products during the period since 1998 to 2008. Based on the data and analysis, the conclusion was made that the increase in the production of autochthonous dairy products in the municipality of Štrpce would contribute agricultural development on the whole and better employment of the local population. The performed analyses were based on modest financial resources, but on the more efficient participation of Serbian institutions as well, with significant expert and scientific support.

Key words: natural resources, analysis of the development in the number of heads of cattle, dairy products, support of the developmental perspective

1 This paper work is a part of research in project TR 20111 given by Ministry of sciencea and tehnological development, Republic of Serbia with title: ''Standardization of technological procedure in traditional producing Golija cheese with application original bacteria of milk acid in aim to protect geographical mark of origin''.

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PROSPECTIVES OF HOMOLJE AS AN ECO-DESTINATION

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Abstract

Homolje with its own heterogeneous and attractive tourist potential, correspond important tourist area of Eastern Serbia. Relief is represented with hills and plains. Climate is moderate continental. Hydrograph is represented by river Mlava with her tributaries. This community is full with different animal and herbal species.

Economy is undeveloped, but natural and anthropogenic fortune, peace, silence, green nature, loveliness of housekeeper, etc., is important potential for development of rural tourism.

Text of roads showing possibilities of sustainable development in area of Homolje, like new possibility for progress in this area. Authors of this work were data collection trough experience on terrain, area monitoring and benchmarking. Homolje can be important eco destination in tourist map of Serbia.

Key words: Homolje, sustainable development, eco destination, tourism

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ROMANIAN FARMER – OWNER, BUSINESSMAN AND ECONOMICAL GOODS CONSUMER

Ion Bucur[1], Cristian Bucur[2]

Abstract

The transition from command economy to competitive market economy brought the Romanian farmer in three aspects: as owner of land and other goods, producer (businessman) and as consumer of economic goods and services. The Romanian farmer could be considered a beneficiary of transition because he became again owner of the land he had before collectivization of agriculture. He could own an unlimited number of animals and technical means. As a owner, the Romanian farmer beside benefits from transition has had losses also. He has not recovered the means of production, which he was forced to take to cooperative, nor the value of them. In a competitive market economy, the farmer is also a business man. He can use his family or he can employ labor resources, he can rent the land or he can associate with other farmers. The farmer initiate, on his own or as associate, business to obtain profit.

Key words: agriculture, farmer – owner, farmer – business man, farmer – goods consumer, economic assets

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THE COMPETITIVE POSITION OF THE ROMANIAN AGRICULTURE

Gabriel Croitoru[1], Mihai Mieilă[2]

Abstract

The development of the national economy competitive position in the context of the global challenges (global economy, opened international markets, fast changes of technology) is both cause and effect for economic development and for life standards improvement. But, the challenges above mentioned have to be transformed into opportunities for Romanian economy. The identification of impact factors on Romanian agriculture competitive position make necessary a close analysis of economy, of business background, of material and human resources, of costs, of investment activities, and of the innovation process.

Key words: competitive economics, agriculture policy, investments, development strategy, global economy, opened international markets

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PRODUCERS EDUCATION ABOUT MICROBIOLOGICAL INOCULATES APPLICATION IN FUNCTION OF SOIL FERTILITY

Nada Milošević[1], Velibor Potrebic[2], Željko Arsenijević[3]

Abstract

Soil protection against degradation in agricultural production is one of the measurements in the frame of aims and guidelines of integral and organic production.

Because of that, there are more and more researches which are directed toward finding the alternative - organic ways in soil fertilization, in the aim of undesirable effects avoiding. Application of microbiological inoculates with nitrogen fixing bacteria with the purpose of soil fertilization, replaces or refill nitrogen mineral fertilizers. Decrement of mineral fertilizers quantities complies with integral agricultural production concept, what represent important step to organic agriculture. Appliance of these new methods requests constant use of available knowledge through education of direct producers. Awareness and habits of producers have to be changed in the direction of multifunctional agriculture and rural development, with spreading of knowledge of soil fertility maintaining by the appliance of all bio-agro-technical measurements.

By inoculates appliance in maize, wheat and soy bean production with certain groups of nitrogen fixing bacteria, soil biogenity is being preserved and maintained, plants needs for necessary assimilation's nutrients are being satisfied, phytoparasites control is secured, healthy food is produced, what satisfied all ecological and economic criterions of viable system.

Key words: soil, nitrogen fixing bacteria, soy bean, wheat, maize, biogenity parameters

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EVOLUTION OF THE PRODUCTION FACTORS IN THE ROMANIAN AGRICULTURE AND ITS' POTENTIAL FOR A COMPETITIVE DEVELOPMENT IN THE ENLARGED EU

Crina TURTOI[1], Camelia TOMA[2], Camelia GAVRILESCU[3]

Abstract

The present endowment of the Romanian agriculture with technical means, corroborated with the scarce management at the level of the agricultural holdings, cannot ensure the performance of agricultural works on due time, as provided in the cropping technologies. This results both in a low productivity level and in large harvest losses. The paper is analyzing the trend of the main components of the production factors and the main synthetic indicators quantifying labour productivity in agriculture: (i) agricultural output per employed person and (ii) gross value added per employed person. Among the main causes leading to this situation, the following have been identified: excessive land fragmentation, low scale use of the technical-material base, precarious operation of the irrigation system, inadequate management of the agricultural holdings and of the production factors in general. The study is accompanied by a comparative analysis with the situation in the EU Member States.

Key words: agricultural structures, farm management, production factors

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THE ROLE OF HUMAN CAPITAL IN RURAL DEVELOPMENT

Jorde Jakimovski[1]

Abstract

The author's starting point is the thesis that discussions on human capital are a key factor for promoting the economic, social, ecological and cultural values of the rural development.

The higher degree of human capital is a prerequisite for economic rise in relation to the sustainable development.

Illiteracy and insufficient education of the people are closely connected to un-proper special distribution of the population, use and unequal distribution of the natural resources and serious ecological degradation of the space. The low degree of education hinders the developmental process in each area of the society.

The education develops the human characteristics and personalities, it provides an opportunity of better life for every person and higher social status.

The author states that on the threshold of the 21st century, the education and the various professional training become factors that depend on each other and that are moving forces of the economic and social development. Connection between the level of the technical progress and the quality of human intervention is more and more important, as well as the need of those that take active part in the economy to be qualified to use the new technology. In each sector and it is the case with the agriculture, the need for evaluating abilities connected with the knowledge and knowledge in the technology is various. The application and ability to use the whole potential of the new technology, as well as the choice of suitable means and methods of work in the agriculture, necessarily depends on education and the flexibility of the farmers on adaptation and acceptance of changes. The situation of the education of the village type population, and the level of the professional training of the farmers was one of the significant obstacles in the development agriculture and the village so far.

The goal of the paper is: *Why is the human capital a central factor in the process of the sustainable rural development?*

Key words: human capital, rural development, education, sustainable development, technology, technical progress.

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AGRICULTURAL REFORMS IN SERBIA

Stojan Jevtic[1], Branislav Gulan[2], Vojislav Stankovic[3]

Abstract

After half a century of wandering and neglecting, in 2009 the agriculture in Serbia is again on the crossroads. How and where to proceed? The science created about 1,500 high-yielding varieties and hybrids, and only 30% of its genetic potential is used. Every fourth Serbian village is heading towards extinction (about 1,200 of them). In the Serbian villages, there are 260,000 single men, who entered their fifth decade without having created their own families. In the same time, there are 200,000 empty homes in the villages, and 600,000 hectares of arable land remain uncultivated! Before the crisis, a GDP growth in Serbia for 2009 was projected at 7%, then it was planned at 3.5%, and now, with the reality check we have a drop of more than 5%, and in agriculture, we can expect a zero rate. The State has still not recognized that agriculture is its strategic sector of economy. After elaboration of each new strategy, the production was reduced.

Key words: agriculture, resources, production, underdevelopment, reforms, strategies

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COMPETITIVENESS OF APICULTURAL PRODUCTS ON SMALL BEEKEEPING FARMS

Slađana Marinković[1], Nebojša Nedić

Abstract

The study investigated the cost and returns on typical small beekeeping farms from five districts in Serbia. On the basis of the terrain investigation data about number of beehives, type of product, bulk of production per beehive and values per measure unit were collected. In accordance to demonstrate the competitiveness of the various apicultural products, analysis of available data was performed by the use of analytic calculations. According to analysis, a participation of labour costs accounted for about 49.65% to 64.15% of the variable costs on beekeeping farms in Raška and Šumadija district, respectively. The economic level was highest on bee farm from Sremski district where every dinar spent in production realized new 2.22 din, while the least economical was the farm from Raški district (1.32 din). The bee farms are to must reduce labour costs and rearrange business orientation based on other bee products, besides honey, like pollen which could be significantly profitable.

Key words: small beekeeping farms, honey, economy

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SUSTAINABLE AGRICULTURE AND FUTURE CHALLENGES FOR AGRICULTURAL RESEARCH AND EXTENSION SERVICES

Bozidar Milosevic[1], Lamberto Lamberti[2], Milinko Milenkovic

Abstract

Development policies in agriculture have been very effective in addressing the problems of agricultural productivity. However, this process caused a global growth in consumption of pesticides, inorganic fertilization components, animal feed-stuffs and heavy machinery. The transfer of technology, usually produced in developed countries, caused a depletion of natural resources and produced social and economic problems that, by neglecting the local knowledge and tradition together with applying not adaptive breeds and varieties, in fact, increased the problem of food insecurity worldwide. Nowadays, many evidences show that resource-conserving technologies and practices, incorporated into the framework of sustainable agriculture, can provide many benefits for farmers, even improved yields and productivity, with introducing only few, or no external inputs.

There is a need for clear national strategy for agriculture and rural development with clearly defined points of sustainable agriculture. The role of research and extension services in implementation of such a strategy is irreplaceable. The present system of extension services has to be reformed in order to achieve the goals of sustainable agricultural development.

Key words: sustainable agriculture and rural development, research and extension

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TRANSFORMATION OF RURAL POPULATION VITAL STRATEGIES

Marina Morekhanova[1]

Abstract

Transformation of rural population vital strategies and current period peculiarity of its adaptation to economic reforms in agribusiness are analyzed in this paper. Special attention is dedicated to the problems of readiness of different social groups to new professional knowledge acquisition, their commitment in it, and to analysis of modern life strategies and employment preferences of rural youth.

The paper is based on sources of sociological researches conducted by the Institute of Agrarian Problems of the Russian Academy of Sciences with personal involvement of the author in one of the Russian regions (Saratov's oblast) in 1993-2007, dedicated to the problems of rural community adaptation to changing socio-economic conditions. The research included polls, budget studies, and "deep" interviews with the budget study respondents.

Key words: rural population, agrarian sector, adaptation, vital strategies, innovations, professional training, raising the level of one's skill

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DESIGNING THE COLLABORATIVE PLATFORM MEANT TO INCREASE ORGANISATIONAL COMPETITIVENESS IN AGRO-FOOD RESEARCH

Gabriela Nedita[1], Mirela Stoian[2], Anca Elena Rădulescu

Abstract

This paper presents the premises and coordinates of realizing a collaborative platform meant to increase organizational competitiveness and knowledge management, expertise and partnerships in agro food research and development. The web collaborative platform may be accessed by organizations who are partners and it has as purpose to use at high levels the intangible resources of the research and innovation community, respectively to accelerate the process of innovation. The platform ensure building a network of information and knowledge in electronic format, in order to optimize time and costs of accessing information, to reduce the impact of personnel who work in research migration, young researchers integration into the system, the possibility to interconnect the network to other similar networks of the outsiders' communities of research.

Key words: collaborative platform, innovation, information, knowledge management

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NON - CONFLICTUAL COMPETITIVE OBJECTIVES IN THE ECOSYSTEM MANAGEMENT

Constanta Popescu[1], Constantin Popescu[2], Silvia-Elena Popescu[3]

Abstract

The objectives that the ecosystem management aims at should not ignore the public's options, but instead should find fundamental scientific arguments satisfying them. These solutions should be the result of the democratic institutional decisions that are explicit or implicit in legislative regulations, ordinances, decisions and budget provisions. Consequently, it can be considered that the general purpose in the ecosystem management is to maintain the ecosystems' characteristics in a broad sense, including both their social and their biophysical components, while the human values include the normative purpose of maintaining the integrity of both the natural and the cultural ecosystem.

Key words: ecological evolutive processes, biodiversity, ecosystem, resources durable administration, ecology, productivity, viability

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EFFICIENT TRANSFER OF KNOWLEDGE IN AGRICULTURE THROUGH COOPERATIVE STRUCTURES

Gabriel Popescu[1], Constantin Florentina[2], Teodora Menda[3]

Abstract

In broad, deep and dynamic process of knowledge transfer, the cooperative structures can have a decided role in improving the information as a factor of production in agriculture. The process of defining a cooperative structure, as the intermediate link between producers and consumers of information and taking in consideration the principles of economic liberalism requires going through several steps which well-define, in the implementation of projects with European funding philosophy, can become self-standing actions.

In this context, it is important to establish criteria through which are defined the target group, tools for promoting the new, and patterns for managing market relationships of agricultural markets.

Key words: knowledge transfer, cooperative structure, information, market, efficiency

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SIGNIFICANCE IN INNOVATION AND KNOWLEDGE APPLIANCE IN SYSTEM OF ORGANIC AGRICULTURE IN SERBIA[1]

Svetlana Roljević, Radojica Sarić[2], Boris Kuzman[3]

Abstract

Organic production is a specific system of food production determined by a set of very strict standards which protect natural resources and cultural identity. It requires greater effort on the side of producers in the implementation of the innovations. It also contributes to opening of new areas for scientific research, so special attention in this paper was given to application of bio-pesticides in organic production, as one of new and, in environment sense, harmless form of crop protection. The use of biological pesticides increases the size of organic production, but contributes to better quality and look of organic products, too, making them more attractive for consumers. In a way that management in organic agriculture confronts decision-making, based on ambiguity which comes primarily from natural surrounding, there was pointed out also on significance in using information technologies, in order to manage the production in more easily way. The aim of this paper is to point out to a need and importance of correlation between the science, technology and producer in our country in unique entirety, because only then the science and technology could be useful and the organic production – efficient.

Key words: Organic production, bio-pesticides, information systems, knowledge, innovations

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AGRICULTURAL SYSTEMS – ROLE AND IMPORTANCE IN THE ENVIRONMENT PROTECTION AND SUSTAINABLE RURAL DEVELOPMENT IN BANAT, ROMANIA

Florin Sala[1], Alin Dobrei[2]

Abstract

Researches were conducted in the Western area of the country, in the Banat Plain and concerned the sustainability of agricultural systems as production systems and means of sustainable rural development. Categories of use of the agricultural land in the county of Timis have suffered changes in the studied period with different amplitude from one category of use to another, also finding uncultivated and temporarily abandoned land. There were recorded changes in the structure of crop plants with implications on crop rotation and agricultural environment. In the studied viticulture systems we observed a high diversity of biological material but technologies show some malfunctions. During this period, the technical park has undergone an improvement both in number and quality even if an optimal level of endowment hasn't been reached yet. Through some indicators the increasing of performance and productivity of the agricultural systems are observed, but much too slow to ensure prosperity to farmers.

Key words: agricultural systems, environment protection, productivity of agricultural systems, rural development

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AGRICULTURAL ECONOMICS DIVERSIFICATION AND ALTERNATIVE EMPLOYMENT IN RURAL REGIONS OF RUSSIA

Vladimir Anatolievich Shibaykin[1]

Abstract

In the article the problems of rural population alternative employment and the problems of agricultural economics diversification are studied. The author suggests the development of country tourism as the solution to the problem of agricultural economics diversification in the regions.

Key words: diversification, rural tourism, employment, rural farms income sources

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EDUCATION OF PARTICIPANTS IN MAP SECTOR WITH AN AIM TO IMPROVE MARKET COMPETITIVENESS AND RURAL DEVELOPMENT IN SERBIA

Svetlana Turudija Živanović[1], Tomislav Živanović[2], Tatjana Marković[3]

Abstract

There are many problems appearing in MAP sector during collection, growing and marketing of medicinal and aromatic plants, such as: decrease in number of plant collectors, absence of licensed plant collectors, decrease in the surface under medicinal and aromatic, absence of subventions in large-scale production, ignorance and restrictiveness of the low regulations that treat this field, etc. All of these directly influence concurrency of the MAP sector on domestic and foreign market and indirectly slow down rural development of Serbia. Special attention in education of MAP sector participant should be devoted to the low regulations. It is normatively regulated by many lows and low regulations (more then 130 different low regulations). However, the environment and nature protection is the filed where many regulations are not yet harmonized with European Union regulations. Following adoption of the low on the nature protection the application of Decree on control of use and turnover of wild flora and fauna (”Službeni glasnik RS”, no. 31/2005 from 8.4.2005).

Key words: MAP, education, resources, low regulations, market

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EFFICIENCY OF CAPITAL INVESTMENTS IN ECOLOGICAL AGRICULTURAL PRODUCTION AND POSSIBLE SOURCES OF FINANCING

Mihai Botezatu[1]

Abstract

The capital investments have always directed towards the areas of activity where the capital increase has proven to be most efficient. From this point of view, the perception of various investors is many times very different. Thus, in today's world, which faces many problems, mainly economic ones, there is the possibility to use capital properly, by making some investments whose purpose is to obtain ecological products, the mankind is interested in today, more than ever.

In order to achieve this goal have to be used some technical but also some economical methods that are referred above.

This paper wants to emphasize the particularities and efficiency of such investments in ecological agricultural production, concurrently with emphasizing the importance that the ecological products have for mankind, mainly in the actual stage, when very many of the agricultural products we consume are counterfeits, with unwanted implications on people's health and on their hope of life.

This paper also presents briefly some possible financing sources of the mentioned investments, which an investor in this domain might take into account.

Key words: ecological agricultural product, certification, shares, bonds, equity capital

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STRUCTURAL CHANGES OF THE ROMANIAN AGRICULTURE IN THE PROCESS OF EUROPEAN INTEGRATION

Anca Dachin[1], Letiția Zahiu[2]

Abstract

The Romanian agriculture has experienced different stages in the process of European integration, while quantitative and qualitative changes in land use structures, provision of inputs, financing sources and production structures have taken place, which needed suitable agricultural policies. The effects of these changes are reflected in the economic performance measured by structural and general indicators, which show a significant gap to the majority of the Member States of the European Union. The paper focuses on the specific problems of holding structures and labor in agriculture and on the necessity to improve the quality of employment in this field, in accordance to the requirements of the modernization process. The capacity of agriculture to use the EU structural funds depends highly on the improvement of human capital and on the development strategies of farmers.

Key words: agricultural structures, productivity, size classes of holdings, employment structures

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THE DEVELOPMENT OF AGRICULTURAL ACTIVITIES IN THE HILL AREA OF DROBOTFOR VALLEY FROM BACĂU DISTRICT, ROMANIA

Mariana Bran[1], Iuliana Dobre, Radu Voicu

Abstract

Because of risk hereupon are insecure the natural resources and other environmental elements, must to act in the sustainable development sense. Permanently, are decisive to assure the healthy life conditions (pure water, fresh air, health food). Thus, in studied zone, are imperative field work of an affected areas from natural disaster (inundations, deforestations, and landfall) and friendly technologies based agricultural activities (in crops and animal husbandry).

Key words: agricultural activities, risk, natural resources, strategy

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CONSIDERATIONS ON DIMINUATION OF THE ECONOMIC-FINANCIAL CRISIS IN AGRICULTURE OF MOLDOVA

Simion Certan[1], Ion Certan

Abstract

The functionality of the new system based on market relations and open for the people is often marked by dynamism, uncertainty, risk, even by hostility and undoubtedly will be affected by the current economic and financial crisis.

Negative effects within this segment of national economy could be reduced through land plots consolidation, development of agricultural market on the Best Practices base. It's considered economic mechanisms for the increase of land plots production through irrigation, landscaping, soil protection, etc.

The specific of small agricultural exploitations is that entrepreneur is owner, manager, investor, worker at the same time, and must have a wide range of knowledge to achieve the success and to do all rolls mentioned above in a proper way.

Key words: Agriculture, crisis, inflation, taxes, credits, property, legal forms, instruments and economic mechanisms, managers, training, consultancy

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