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PREFACE

APSTRACT is getting more and more appreciated by professionals and academics in the fields of agribusiness and rural development. From 2007 to 2013 there were 300 articles published, coming from 29 different countries. The top four most publishing countries are: 1. Hungary, 2. Serbia, 3. The Netherlands and 4. Italy. The IDEAS/RePEc Simple Impact Factor of the journal has increased from 0.01 to 0.045.

In 2013 the 3rd bi-annual AGRIMBA Congress and annual board meeting of our organisation were organized in Budva, Montenegro. It was a successful event! The work by the organizing committee chaired by Dragoljub Jankovic (Podgorica) is gratefully acknowledged here. From all the papers presented 23 were selected to be published in the special issue that is included in this volume. It is edited by Bruce Ahrendsen (Fayetteville, US), Johan van Ophem (Wageningen), Harry Bremmers (Wageningen) and Wim Heijman (Wageningen).

A new idea came up during the annual meeting. The idea is to create an umbrella, one name organisation with different MBA programme's under it. This would create a European MBA-network, with tailor made MBA's in the centres, on topics like rural development, agribusiness and rural tourism. This is a very attractive way to create opportunities for AGRIMBA in the future and to attract more students. I am looking forward to the suggestions on this issue that will be made by the commission that is installed by the Board.

One of the most successful AGRIMBA events is the annual joint study week for all MBA students. The 2013 joint study week was organized in Warsaw. The joint study week is a great learning experience for participating students that come from multiple universities, and it provides a dynamic environment for them to gain and apply knowledge. Appreciation goes out to Edward Majewski (Warsaw), Bruce Ahrendsen (Fayetteville), and others for managing and organizing. The 2014 joint study week will be in Nitra (Slovakia).

I hope that you will read this volume with great pleasure.

Wageningen, December 2013

Wim Heijman
Editor in Chief

EDITORIAL ON AGRIBUSINESS AND RURAL DEVELOPMENT AS A GLOBAL CHALLENGE: A THEMATIC ISSUE OF APSTRACT

During June 26–27, 2013 the third AGRIMBA-AVA congress was held in Budva, Montenegro. The theme of this congress was *Agribusiness and Rural Development as a global challenge.* Agribusiness and rural development are both fast developing research areas, especially in the numerous universities for Life Sciences in Europe and beyond. During the congress, attention was paid to both the agro-food sector and rural development. Sessions were organized around the themes: *Entrepreneurship in rural areas and agribusiness; International agribusiness; Food markets and marketing; Stimulating innovation; Improving food safety and quality; Tourism (agri-rural); New ideas in agribusiness and rural development; Rural resilience and competitiveness; The role of education in modernizing agribusiness and rural areas*; *Globalization of the food industry; Green economy and tourism; and The effects of global economic crisis on agribusiness and rural development.* The conference was successful, both in terms of number of participants and in the quantity and quality of the presented papers. Participants originated from eastern and western Europe, and some even from distant other parts of the world like North America and Africa. Lively discussions were reported during and after the sessions. Through a process of evaluation and selection we arrived at 23 papers that are now published in this special issue of *APSTRACT*.

As a basic scheme for categorising the contributions in the remaining text, we use Oliver Williamson's classification of four levels of social analysis (Williamson, 2000[1]): embeddedness, institutions, governance and resource allocation.

Embeddedness

Papers ranked under this heading address long term factors affecting social ordering and economic structuring, like culture, tradition, effects from and by education and baseline political premises.

Human capital is the most important resource in society, the development of which is very important for many phenomena, like for instance competitiveness. In their contribution "*Application of Innovative Training Methods in Business Higher Education at the University of Debrecen*"**, Georgina Árváné Ványi, Tímea Gál, András Nábrádi, Zsolt Csapó and Károly Pető** assess the performance of the Team Academy at Debrecen University. The gist of this training is that the students learn entrepreneurship by their 'living' organisations with the application of the principle called 'learning-by-doing'. One of the most important goals of its application is to enhance the individuals' performance and to evolve the skills of the individual as much as possible, which is of importance in an environment of growing self-employment.

In their contribution "*Education for rural development and agribusiness in post-socialist Slovakia"* **Danka Moravčková, Izabela Adamičková and Peter Bielik** describe the crucial role of education and training in fostering agribusiness and rural development during the transition period in Slovakia. The main priorities and perspectives in the national strategy for agricultural education for the period 2007-2013 are discussed. The paper stresses the importance of adult education under the present circumstances and discusses the challenges connected to the future development of education and training in the rural areas.

Region is one element of social ordering. The following contributions pay attention to various aspects of the region: competitiveness, regional development, rural resilience, regional fairs and regional development by attracting cyclists.

In *"the Competitiveness of Rural Areas in the Republic of Tatarstan"* **Landysh Sitdikova, Wim Heijman and Johan van Ophem** analyse the main factors influencing the competitiveness of rural areas in the Republic of Tatarstan (Russia). The authors used principal component analysis (PCA) to determine the weights of 10 indicators that have an effect on the level of regional competitiveness. The major influencing factors appeared to be the level of economically active population, investment in housing and education.

According to **Janko Radulovic** in his article *"The problems of regional development in Montenegro"* regional development depends on a number of factors. Spatial concentration in regional development arises because of different levels of regional competitiveness. This often leads to disparities in living standards between rural and urban areas and, as a result, demographic problems caused by migration into urban areas. In Montenegro an efficient regional policy is needed to deal with these problems.

Bonaventure Minani, Déoguide Rurema and Philippe Lebailly analyse in their contribution *"Rural Resilience and the Role of Social Capital of Kirundo Province Farmers in North of Burundi"* the role of social capital through the local association network for improving family agriculture and the resilience to climate change and conflict crisis. It is concluded

[1]O. Williamson (2000). The New Institutional Economics: Taking Stock, Looking Ahead. Journal of Economic Literature 38 (3), 595–613.

that the social capital network positively influences their income and resilience to climate change and social conflicts.

In the paper *"Economic Effect of Fairs – A Complex Approach"* **László Kárpáti** describes the KAVA model, a numerical model by which the economic effect of fairs can be measured. In this novel approach, each stakeholder group involved in a fair is evaluated in numerical terms, taking into account the specific cash inflow and outflow categories of that group. The net cash flow is considered as the economic value. Adding together all the categories, the so-called complex economic value and effectiveness is established for the fair surveyed.

Eke Eijgelaar, Paul Peeters and Pieter Piket present in their paper "*European Cycle Tourism Economic Impacts Model Revisited: Tool for Sustainable Regional Rural Development?*" findings from an economic impacts model based on direct expenditures for European cycle routes. Their main findings are that cycle tourists' daily spending is comparable to that of other tourists, and that cycle tourism in particular can contribute to rural economies that have previously not enjoyed mainstream tourism development. Furthermore, cycle tourism has a far lower negative impact on the environment (in terms of carbon dioxide emissions) than other forms of tourism. Cycle tourism is therefore a good example of a low carbon tourism product which could be developed as a major slow travel opportunity across (rural) Europe.

Institutional variables

The following papers can be attributed to level 2 of social analysis, the level of the institutional setting for agriculture and agribusiness.

Jelena Janjusevic's contribution, "*Using sustainable development tools for solving property rights in Montenegro*", aims at analysing and solving the problem of inefficient energy use. The approach presented links solving the problem of illegal construction with increasing the level of energy efficiency in households, businesses and other facilities.

In the paper by **Mirjana Čizmović and Milica Kovačević** *"Spatial Urban Plans as a Base for Agribusiness Development"* a plan is proposed for successful agribusiness and rural development in Montenegro that calls for a participatory approach to development. Within the plan are targeted groups, such as landowners, farmers and entrepreneurs, potential investors, non-governmental organizations and the media. The authors develop a communication strategy that will promote dialogue among the targeted groups, whose participation is essential for the plan's success.

Quite of a different kind is the contribution of **Harry Bremmers and Bernd van der Meulen**: "*Opportunities, problems and pitfalls of nutrition and health claims*". Consumer information, for instance in the form of claims on a food package, influences stakeholders in different and sometimes adverse ways. This contribution addresses controversial strategies and shows ways to improve the institutional arrangements with respect to food information.

In their paper "*Making Agricultural Support More Objective Oriented: Linear Programming Approach for Ukraine*", **Taras Vysotskyi and Olena Kovtun** consider the potential change in state agricultural support distributions that may occur if a de-centralized approach based on expert judgment at the district level was used to allocate support. They find some similarities and some differences in the model's optimal allocations with the actual allocations. All programs that were unfunded remained unfunded while funded programs either received additional or reduced allocations based on the model. Most interestingly, the greatest percentage change in potential benefits resulting from a change in allocations occurred in low budget years.

Some contributions addressed the economics at the farm and agribusiness levels, which are now summarised.

In her contribution *"On farm incomes in Poland"* **Agnieszka Judzínska** analyses the dynamics in farm incomes as a result of the accession to the EU. Generally speaking, the EU accession has led to an improvement in the economic situation of farmers, mainly caused by the EU direct payments. Other factors like improved productivity played a less important role. Higher incomes enabled farmers to increase their expenditures and modernize their farms. However, the small size of many Polish farms is a threat for their competitiveness and the EU-support will not be sufficient to compensate this.

Stefania Czekaj, Edward Majewski and Adam Was assess the impact of the "greening" aspect of the CAP in their article *"The Impact of 'Greening' of the Common Agricultural Policy on Polish farms"*. The authors describe the growing importance of the environmental component in the EU's agricultural policy and its consequences on the farm level. The paper discusses a number of scenarios as to possible changes of the direct payment system, using a linear programming model. The results show that 'greening' may have a negative impact on the volume of agricultural production as well as on farm income.

Josip Juračak and Dario Vukalović review trends in the agricultural business sector and compare those trends with the entire Croatian economy in their paper "*Recent Trends in the Croatian Agricultural Business Sector*". They present a number of different economic and financial indicators and conclude that the Croatian agricultural business sector experienced the same general trends as the economy as a whole. Contrary to what had occurred in the United States, the Croatian agricultural business sector suffered along with the general economy during the recent recession.

Governance

Level 3 in the social analysis typology of Oliver Williamson concerns governance such as: contracting arrangements, the transaction costs thereof, or alternative methods of supply and supply chain management.

The contribution of **Francesco Contò, Felice Adinolfi, Mariantonietta Fiore and Piermichele La Sala** is focused

at developing "*An Incubator Model based on the Territorial Value Chain*". The paper aims at investigating the link between rural development and territorialisation in a South Italy region. It shows that the developed model of territorial organization is able to bring together territorial capital and local stakeholders' interests.

Resource Allocation

Level 4 concerns the factors that influence the allocation of resources that in turn affects business and social performance. Resource allocation is preceded by the gathering of information on the key factors that contribute to value added.

The objective of **Cristina Salvioni and Lara Fontanella's** paper *"Diversification Strategies and Their Impact on Farm Performance"* is to identify factors impacting income per labour unit at Italian farms. Based on their econometric modelling, farm size has a positive impact on farm income, while the class of small farms and the relative use of family labour have negative impacts. They did not find any impact on income from the use of income diversification and product diversification strategies. This is not surprising since these strategies may be considered as risk management instead of income enhancing strategies.

Sustainable production is an outspoken aim in the European Union. The optimization of production processes of biomass utilization by applying business modelling is central in the contribution of **István Takács and Katalin Takács-György**: "*Arguments of optimization of biomass utilization for energy production*".

Resource allocation is also put central in the contribution of **Benedykt Pepliński, Karol Wajszczuk, Rafal Baum, Dariusz Majchrzycki, Jacek Wawrzynowicz, Dariusz Lisiak and Piotr Janiszewski**: "*The efficiency of intensively and extensively fed porkers*". It appears from reviewing the qualitative characteristics of meat obtained after slaughter that less intensively fed animals had better characteristics than pigs fed with a mix that is richer in protein and energy content.

Slobodanka Krivokapić, Neda Dević and Stanka Filipović discuss in their contribution "*Research on the Natural Features of Karst Water, on the Example of Some Water Intakes"* the quality of water in Montenegro. With respect to water potential, Montenegro is at the top of Europe. However, economic development which is not based on the conservation and good governance of natural resources may have negative consequences for the overall water quality. This reflects in the physical properties of the water. They indicate that water quality is on the decrease due to various polluters.

Kristina Sobekova, Michael Thomsen and Bruce Ahrendsen in their paper *"Market Trends and Consumer Demand for Fresh Berries"* present a market analysis of fresh berries in the United States. They estimate a complete demand system and conclude that retail demands for all berry crops are elastic, although at different magnitudes. They also find that the berry types are substitutes for one another. Their results are useful for growers, consumers, and other market participants, particularly as the different berry crops compete in the market.

Radislav Jovović and Dragoljub Janković in "*SWOT Analysis and Identification of Potential and Needs of Fruit and Vegetable Sector in Montenegro, and Development Strategies"* state that the proceeds of the sector in Montenegro are relatively meagre. The paper includes a SWOT-Analysis and identification of potentials and needs of the fruit and vegetables sector in Montenegro. It provides strategies to improve productivity and profitability.

Vlade Zarić, Zorica Vasiljević and Nebojša Nedić focus on the "*Marketing strategy of Serbian honey producers*". Acknowledging that honey production is important, as to the product itself but also with respect to the impacts on sustainability, insight is gained in the production costs, the benefits and the way the final product can be marketed.

Marija Janković contributes a paper entitled "*Exploring the Value of Brands in the Montenegrin Market of Bottled Spring Water*". It contains a qualitative approach to assess and improve the market value of bottled water brands, by analysing the general characteristics of retailers as well as of customers.

All in all, a wide variety of topics is included in this special congress issue of *APSTRACT*. The different contributions express the similarities, differences, opportunities and joint problems of the agro and rural sector across Western and Eastern Europe.

The guest-editors:

Bruce Ahrendsen (University of Arkansas),
Harry Bremmers (Wageningen University),
Wim Heijman (Wageningen University),
Johan van Ophem (Wageningen University)

December 2013

MARKET TRENDS AND CONSUMER DEMAND FOR FRESH BERRIES

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***Abstract*:** We present an analysis of markets for fresh strawberries, blueberries, blackberries and raspberries in the United States during 2008–2011. We use weekly panel data covering supermarket purchases in 52 cities. The primary goal is to estimate demand elasticities for fresh berries and thereby provide a better understanding of consumer behaviour in response to price changes and the nature of competition among these crops. We estimate fixed and random effects models for double log demand equations and a complete demand system, the Almost Ideal Demand System. The latter specification can be used to estimate demand relationships that conform to utility maximising behaviour. The elasticity estimates are very robust across the different specifications and estimation methods. This increases confidence in our findings and provides some assurance that choice of functional form or estimation method is not driving our results. We find that retail demands for all berry crops are in the elastic range and that the different berries are substitutes for one another. The demand for strawberries was the least elastic with an own price elasticity of –1.26 and blackberries were the most elastic with a demand elasticity of –1.88. Blackberry demand was also the most responsive to the prices of competing berry crops. The study provides clearer insight into markets for berries in the United States. In addition, it fills a gap in the present lack of up-to-date consumer demand elasticities for these crops and will be useful for growers, decision makers and consumers.

Key words: berry crops, demand analysis, retail food markets

1. Introduction

In recent years, consumption of fresh berries has increased (Monson, 2009). At present, fresh berries are available in retail stores all year long and are sourced from different regions of the United States or the world depending on growing seasons (Lin *et al*., 2003). One factor that has contributed to the growth in markets for fresh berries is the recognition that berries are high in desirable phytochemicals that may promote human health and protect against disease (Cook, 2011). Cardiovascular diseases, cancer and obesity currently kill more people every year than any other cause of death. Fruit and vegetables are an important component of a healthy diet and, if consumed daily in a sufficient amount, could help to prevent these major diseases (FAO and WHO, 2004). The link between consumption and health provides promotion opportunities to fruit and vegetable producers (Lucier *et al*., 2006). Fresh berry producers in particular have used positive health attributes to promote increased consumption. The benefits of consuming berries have been widely diffused by generic promotion programs supported by grower assessments (Cook, 2011). Berries are considered to be high-valued speciality crops. This means that producers of berries are capable of earning higher returns per unit of land than could be achieved in more traditional agricultural products.

Figure 1 shows the trend in berry consumption as seen in the retail market sample used in this study. The increase in volume over this short time span is striking. The figure also shows the relative sizes of the different berries we consider in this study. Fresh strawberries are by far the most consumed

fresh berry by volume. Fresh blueberries represent the next largest retail market by volume. Blueberries have become more popular due to very strong promotion of the positive health attributes of the fruit (Yang, 2008). Fresh blackberries and raspberries are much smaller by volume but have also experienced a very rapid growth in demand.

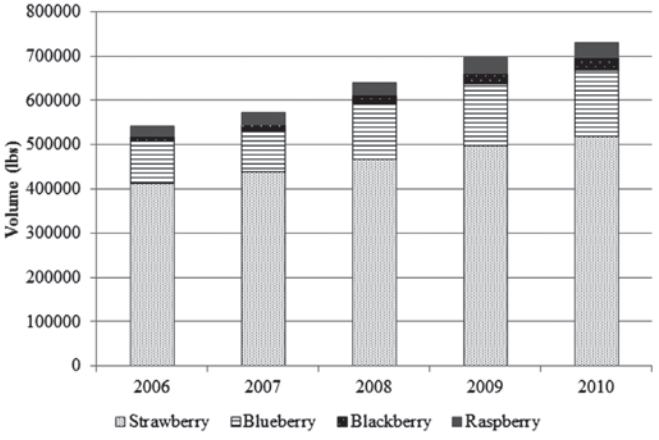

Figure 1. Total volume of berries in the U.S., 2006–2010

Due to the growing importance of retail fresh berry markets, there is a need to understand the demand relationships among these crops. This will provide a better understanding of consumer behaviour and will facilitate grower-led efforts to promote their products. In this study, we estimate the own price elasticity of demand for each type of berry, cross price elasticities of demand between the different berries, and expenditure elasticities, in an effort to understand demand conditions in the U.S. berry markets. Before presenting this analysis, it is useful to provide some general background on price and quantity relationships in these markets.

Figure 2 shows that fresh berries are highly seasonal fruits and their price and quantity fluctuate through the season. The peak season for strawberries in the U.S. is from April to July, when consumption is at its highest point and prices are at their lowest points. In comparison to the other fresh market berries, strawberries have the longest peak season. Fresh blueberry prices show the most fluctuation over the season. Retail blueberry prices are at a high when volume is at seasonal lows and vice versa. The blueberry season starts around July and lasts into late August and the beginning of September. At the end of the year (November, December) there is almost no supply of blueberries. The blackberry season starts in May and lasts until late summer. The raspberry season starts slightly later, around June, and runs until the end of August. Blackberries and raspberries also show an inverse relationship between prices and volume at retail. However, these berries tend to command relatively high prices throughout the year.

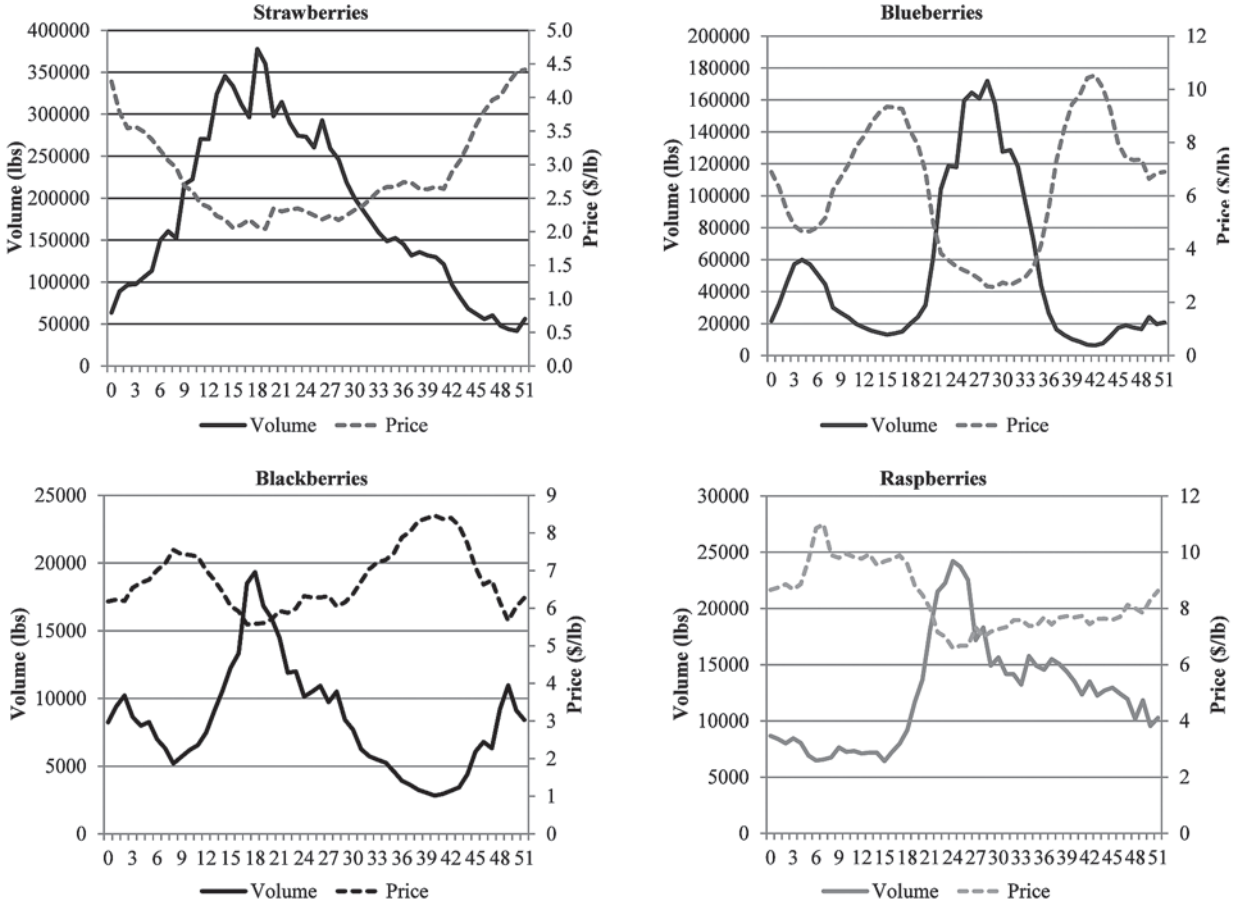

Figure 2. Average volume and price of strawberries, blueberries, blackberries and raspberries in the U.S. by week for 2008–2011

2. Methods

In this study we used weekly data covering 52 U.S. geographic markets from the 1st of March 2008 until the 19th of February 2011. Our dataset contains information on the volume and prices of berries being sold through retail supermarkets. Volumes are reported in pounds per market per week. Prices were reported by retail package size and vendor and so were converted to dollars per pound using the weight of the retail package being sold. These data were then used to estimate demand elasticities using two modelling approaches. The first approach involved estimation of double-logarithmic demand models using two-way fixed and random effects models. The second approach involved estimation of the Almost Ideal Demand System (AIDS) (Deaton and Muellbauer, 1980). Specifically, we estimate the linear approximate AIDS model. This has been commonly used among demand researchers. The model can be estimated with restrictions that are consistent with utility maximisation subject to a budget constraint, and with further restrictions that allow aggregation across consumers (Green and Alston, 1990; Thompson, 2004). Both Marshallian and Hicksian elasticities can be obtained from estimates of the AIDS model. According to consumer theory, the Hicksian demand functions are derived by minimising a consumer's expenditures and show quantity demanded as a function of prices and a given level of utility. On the other hand, the Marshallian demands are derived by maximising the utility and show quantity demanded as a function of prices and income (USDA ERS, 2009).

3. Results

Tables 1 and *2* provide the Marshallian and Hicksian elasticity estimates, respectively.

Table 1. Marshallian elasticties of U.S. demand for fresh berries

	Price of				
Demand for	Straw-berry	Blue-berry	Black-berry	Rasp-berry	Expend-iture
Strawberry	**–1.25610**	0.12293	0.05347	0.07970	1.02250
Blueberry	0.32354	**–1.49164**	0.06401	0.10410	0.99654
Blackberry	0.52144	0.23716	**–1.88447**	0.12587	0.99959
Raspberry	0.39930	0.19818	0.64670	**–1.66215**	0.99811

Table 2. Hicksian elasticities of U.S. demand for fresh berries

	Price of			
Demand for	Strawberry	Blueberry	Blackberry	Raspberry
Strawberry	**–0.66498**	0.92289	0.52041	0.65419
Blueberry	0.89965	**–0.71199**	0.51910	0.66400
Blackberry	1.09931	1.0192	**–1.42799**	0.68749
Raspberry	0.97632	0.97906	0.52047	**–1.10136**

The Marshallian price elasticities reported in *Table 1* are very similar in magnitude to those found in the double-log demand specifications. Consequently, only the elasticity estimates from the AIDS model are reported. The Marshallian elasticities in *Table 1* show that retail demand for each kind of berry is own-price elastic. This finding is not unexpected. In a supermarket setting, there are typically many fresh fruits for sale which can serve as substitutes for berries to one degree or another. The easy access to substitutes for berries is likely to be one reason why demand is own-price elastic. Among the four types of berries, the retail demand for strawberries is the least responsive to the price with an elasticity of-1.26. Strawberries are a stable berry crop which have had a long presence in the retail produce departments. Consumers can reasonably expect to find strawberries available all year around and so they are likely to be a planned purchase item on consumer shopping lists. This is likely to be one reason why they are less own-price elastic than some of the other types of berries. Blackberries, on the other hand, are the most responsive to changes in own price with an own- price elasticity of –1.88. Blackberries are a relatively new crop on the market and are likely to be driven by impulse purchases in the supermarket. The own price elasticities for raspberries and blueberries are –1.66 and –1.49, respectively.

Cross-price elasticities of demand are positive indicating that the berries are substitutes for one another. In the double log models (not reported), nearly all of the cross-price elasticities are statistically significant at the 1% level. Some of the cross price elasticities show stronger substitution than others. As shown in *Table 1*, the price of blackberries has a relatively minor impact on the demand for strawberries, blueberries and raspberries. However, the demand for blackberries is influenced heavily by the prices of competing berry crops, especially strawberries and blueberries. Again, this is consistent with blackberries being an impulse item in the supermarket and reflects a substitution switch when consumers find higher prices for strawberries and blueberries. The Hicksian own-price elasticities (*Table 2*) are lower than Marshallian elasticities. However, this is expected because the Hicksian elasticities represent substitution effects after having compensated consumers for the income effect of the price change. The Hicksian elasticities also show the larger substitution effects that occur after compensating consumers for income effects.

Finally, all of the expenditure elasticities in *Table 1* are positive. The expenditure elasticity for strawberry is 1.023 while blueberries, blackberries and raspberries are 0.997, 1.000, and 0.998, respectively. These results demonstrate that consumers would increase their consumption of each berry in nearly equal proportion to increases in expenditure on berries as a group. This finding is consistent with data presented in *Figure 1,* showing the growth in fresh-market volume for each kind of berry over the past few years.

4. Conclusion and discussion

The objective of the study was to estimate demand elasticities for four berry crops in the United States:

strawberries, blueberries, blackberries and raspberries. These berry markets are growing and so there is a need to understand their basic demand conditions. One key finding is that the demand for each type of berry is quite responsive to price. This means that there will be considerable volume growth in demand if berry prices fall as the result of improvements in production methods or due to increased efficiency in the farm-to-retail supply chain. For emerging markets like fresh blackberries and raspberries, such gains are likely as the industry expands and so we can expect fresh market volume to continue to increase over the next several years.

There is also a need to understand how these different fresh-market berries are competing with one another in the retail marketplace. We present strong evidence that the berry crops are substitutes in demand. Blackberries are especially sensitive to changes in the prices of competing berry crops and this is probably the result of their fairly recent emergence as a year-round supermarket item. Strawberries and blueberries are less responsive to changes in substitute prices. These substitution relationships are important for growers and marketers because they point to the spillover effects that can be expected as growers promote the health benefits or fund efforts to improve production efficiencies. For example, our findings indicate that promotion efforts for strawberries and blueberries are likely to be having positive spillover effects on blackberry and raspberry demand.

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SWOT ANALYSIS AND IDENTIFICATION OF THE NEEDS, POTENTIAL AND DEVELOPMENT STRATEGIES OF THE FRUIT AND VEGETABLE SECTOR IN MONTENEGRO

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Abstract: Fruit and vegetable production in Montenegro benefits from naturally favourable conditions in terms of climate, soil and water resources. Such conditions enable high quality fruit, vegetables and vines to be grown, and fruit and vegetable production and viticulture have a long tradition as well as the cultivation of a wide assortment of produce. A significant number of Montenegrin households therefore deal with horticultural and wine production, although on a small-scale.

Along with the global market trends, the level of domestic consumption, the expected evolution of the distribution system in Montenegro and the planned dynamic developments in the tourist sector, these natural conditions contribute to creating basic conditions for the development of the considered sector. Market opportunities are favourable and represent an additional contributing factor towards its development.

In spite of the favourable climate for production in this sector and the supportive market opportunities, the real value of Montenegrin products at sector level is quite low. We conduct a SWOT analysis of the sector aimed to find out its potential as well as the needs of the sector. Our starting hypothesis is that the potential of this sector in Montenegro is greater than current activity/production, and that suitable strategies can provide higher results in this sector. The main outcome of this paper will be our suggestions for improvement within the sector.

The SWOT analysis will be completed according to the PESTEL categorisation, after which Opportunities and Threats will be grouped into three major strategic categories: "New market trends", "Sector financing" and "Structure and functioning of the value chain". The SWOT analysis outcomes, when regarded alongside a review of global market trends and domestic production potential, lead to strategies for the improvement of the sector.

Key words: SWOT analysis, fruit and vegetable sector, market trends, improvement, strategies

1. Introduction

The global fruit and vegetable sector is constantly and rapidly changing. New competitors are entering the market, including countries which are new entrants into the global horticultural sector but also countries such as Egypt, Turkey, Kenya, some Latin American countries, etc. and other countries and regions across the globe that benefit from "Mediterranean" climate conditions and can thus produce quality wines (Australia, New Zealand, South Africa, Chile, California). Supermarkets are progressively increasing their market share and ruling the market through higher concentration of demand, stricter quality standards, and wider private labels. The suppliers are reducing in number and increasing their average size. Innovation shall be a key for producers to compete with private labels. In fact, although value still remains important, innovation in terms of new flavours, packaging and marketing campaigns could differentiate brand-products from store brands (Nielsen and Foodnavigator.com, 2009).

The observed trends are rapidly expanding from developed countries to those that recently joined the EU and eventually to those that are in the process of accession (Croatia and Serbia first, then Montenegro, Macedonia and Bosnia-Herzegovina) or still in transition (Albania). Owing to the globalisation of the economy, the positive effect of the previous experiences and the "emulation" principle, the speed of changes in the latter countries is always faster than in the former ...

The Montenegrin fruit and vegetable sector needs a careful, state of the art analysis, in order to obtain a clear view on its prospects. Competition is severe, but opportunities are also present. Opportunities for exporters to the EU market may include:

- the EU is not self-sufficient for fresh fruit, but has a 13% trade deficit,
- increasing income, changing consumption habits and growing consumption in the new Member States,
- cost-effective production, especially off-season,
- increasing the scale of production,
- increasing the supply by joining forces, forming producer groups or producer organisations,

- niche markets,
- exotic fruit, including "super fruit" (fruit with a high degree of beneficial nutrients like antioxidants – pomegranates, blackcurrants, blueberries, blackberries etc.; most of these are consumed after processing e.g. as fruit juices),
- organic produce,
- fair trade produce,
- added value produce e.g. fresh-cut fruit and vegetables,
- healthy snacks,
- convenience, ready-to-eat produce, etc.

The authors of this paper focus on an analysis of the competitiveness of the Montenegrin sector, and conducted a SWOT analysis with the aim of contributing to defining a clear view on the prospects of the sector, especially on trade on the EU market.

2. Competitiveness of the Montenegrin sector

Montenegro has a significant and increasing trade deficit in agricultural products with the EU (source of data: Euro stat):

- EU imports from Montenegro (average 2008/2011): fruit € 1,1 millions (million), vegetables € 2,1 million, wines € 0.5 million.
- EU exports to Montenegro (average 2008/2011): fruit € 0,3 million, vegetables € 38,8 million, wines € 3,8 million.

In terms of domestic production, grapes have just a 14% share of land, but contribute to 28% of total agricultural value. Other fresh vegetables (peppers, tomatoes, watermelon) also contribute significantly to agricultural value. Contrarily, fruit cultivation takes up 37% of the total hectares but contributes to less than 14% of agricultural value. Thus, comparing the share of production of value with respect to area, which represents an index of value-added, grape ranks first (Δ +13,5%), followed by peppers (Δ +7,4%), tomatoes (Δ +5,8%) and watermelons (Δ +2,4%). At the other end, potatoes show a negative contribution to value-added (Δ –5,9%), as does fruit (Δ –23,8%). This exercise leads to drawing a specific matrix of Value-added (Chart 1), where the single products are placed according to their contribution to added value, considering competitiveness as the ability to generate valued-added at farm level independently from the market share. Grapes are placed in the positive side of the matrix, fruit and potatoes in the negative side, and other horticultural produce in intermediate positions.

The real value of Montenegrin products at sector level is quite low, due not only to the efficiency of production but also to constraints and inefficiencies in the supply chain: the cool chain and facilities of storage, loss of product, high rate of self-consumption, etc. However, official figures show that ostensibly, Montenegro presents a competitive advantage in terms of the value of products with respect to EU27 and CEFTA countries. Many agricultural products (grapes, fruit and vegetables) present an average value that is more than 50% lower than the EU or CEFTA average: the value of the grape is 55% lower than the EU average and 75% lower than CEFTA. Comprehensively, vegetables show –52% and fruit –61% on CEFTA average (I don't understand this sentence... please make it clearer). However, this is also because of the methodology adopted due to the structure of the comparable available data (FAOSTAT), providing prices which are not for the market but only for data, both in terms of value of production and volumes of production, which enable us to calculate a kind of Unit Value "index": (value of production / total quantity of production). This has a different meaning than price, which is the result of demand and supply. The unit value is the value of production related to total production (tons), that is including production sold + waste + production sold at low quality + self-consumption, all issues these latter that strongly influence the Montenegrin sector, thus reducing the apparent level of competitiveness. Nevertheless, it is necessary to stress that the efficiency of production is high only for certain products (tomatoes, watermelons, figs, apples, plums, oranges) if benchmarked with CEFTA, while with respect to the EU average, only figs are competitive.

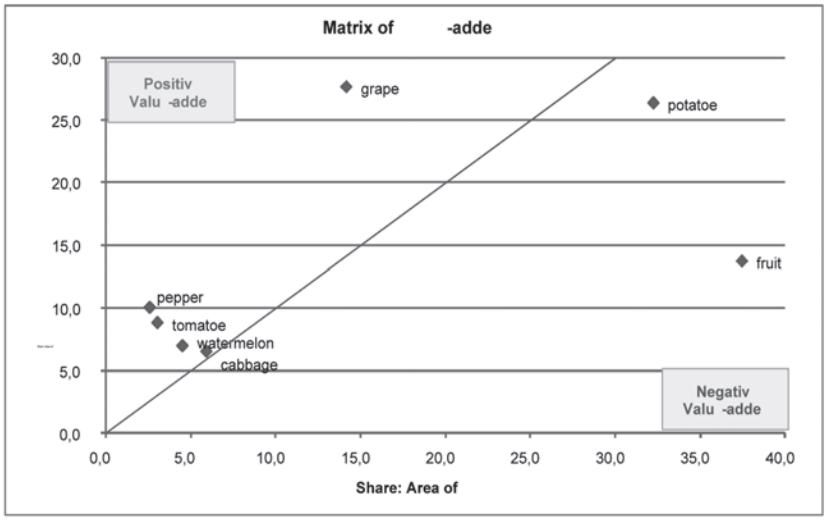

Chart 1. Matrix of Value-added for Monten

Source: Authors calculations over data from Statistical Year Book of Montenegro, 2009, 2010 and FAOSTAT

In other words, the positioning of value may provide good competitiveness, as commodity, in the short term, but it is often also an index of quality performance, as a low price is often the reward for low quality. Thus, price positioning should be combined with strategies for mark-up, quality and efficiency in order to create added-value and sustainable positions in the long term. With a similar methodology, an "Index" of yield has been calculated from FAOSTAT data on production and area: index: total quantity of production / total area.

Price competition is very important in the short term view but, in order to draw long term strategies, a map of competitiveness has

been outlined. For that purpose, two indexes have been calculated using the data of unit value and yield in benchmarking with EU and CEFTA countries:

- Cost-Quality competition: estimated from difference (Δ) of unit value of specific products of Montenegro with respect to the EU or CEFTA average;
- Efficiency competition: estimated from difference (Δ) of yield of specific products of Montenegro with respect to the EU or CEFTA average.

Then, the two indexes have been crossed to each other in a single matrix in order to identify the market position of Montenegro with respect to EU or CEFTA countries (matrix of strategy of competition) and four competitiveness areas have been identified:

- Product differentiation (right lower corner of the matrix): low efficiency but high price of Montenegro's products;
- Economy of scale (left higher corner of the matrix): high efficiency and low price;
- Product and quality differentiation (right higher corner of the matrix): high efficiency and high price, and
- Poor competition (left lower corner of the matrix): low efficiency and low price.

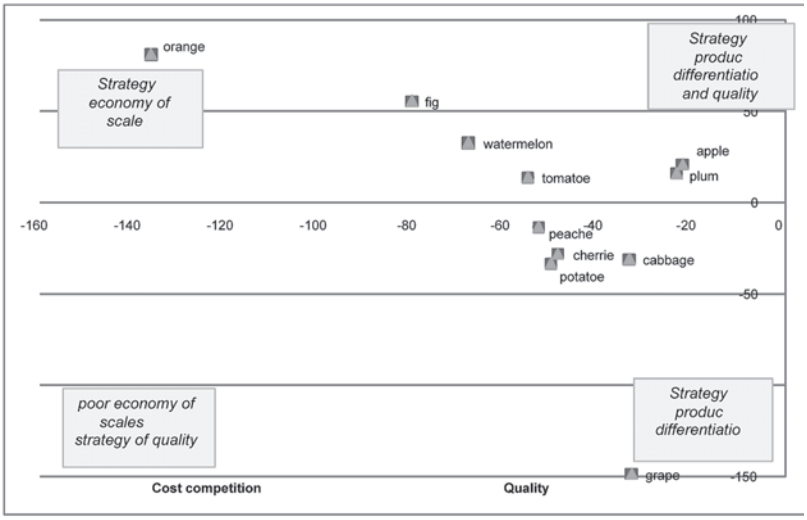

Chart 2. Matrix for competition strategy: positioning of Montenegrin horticultural products and grapes with respect to EU countries

Source: authors' calculations over data from Statistical Year Book of Montenegro, 2009, 2010 and FAOSTAT

According to the matrix, Montenegro presents all products in the negative area of values if compared with both the EU and CEFTA. Some competitiveness can be highlighted in efficiency. Montenegro shows competitive advantages for some fruits (oranges, figs, apples, plums, watermelons) and some vegetables (tomatoes) in the CEFTA market. Montenegro is also competitive for grapes in the same market, but mainly on the basis of quality since the price advantage could be quite risky, in the shot term in case of other competitors entering the market with low costs in the same area. Other horticultural products (peaches, cherries, potatoes, cabbages) are not really differentiated in the market due to quality constraints and *only seem to be competitive in the short term* (Chart 2 Matrix for competition strategy: positioning of Montenegrin horticultural products and grapes with respect to EU countries.

With respect to the EU market, Montenegro only has a good market positioning for figs and watermelons. Many others horticultural products (tomatoes, plums, cabbages) can compete solely on a price basis but have difficulties creating value-added. Consequently, strong improvements are required starting from breeding and cool chain management. Other kinds of produce (apples, potatoes, oranges) show some competitiveness in terms of product differentiation but with constraints in efficiency of production. Potatoes and fruit show a negative added-value position, while grapes are the only merchandise with a clear positive contribution to added-value. All other kinds of produce are in an intermediate position. Figs should develop the volumes of sales and also differentiate the market positioning through improved quality for successful exports to the region and CEFTA countries. Improvements in the efficiency of mandarin production is essential to compete with regional competitors, like Croatia, which produce similar varieties at larger volumes in the Neretva Valley and Markovic. In fact, if we look at the competitiveness charts, the volumes of citrus fruit should definitely be increased in order to compete on the regional and CEFTA markets, while on the demanding and crowded EU markets, product differentiation would be the best strategy to develop Montenegrin mandarins.

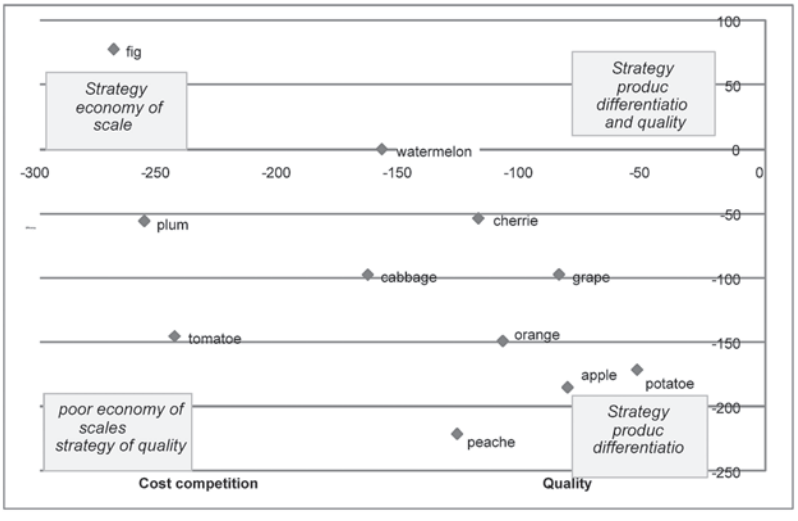

Chart 3. Matrix of strategy of competition: positioning of horticultural products and grape of Montenegro with respect to EU countries.

Source: author calculations over data from Statistical Year Book of Montenegro, 2009, 2010 and FAOSTAT

3. SWOT Analysis

The SWOT analysis has been completed according to the methodology following a PESTEL categorisation. After a long review, the final screening identified 16 Opportunities and 11 Threats that matched with 29 Points of Strength and 32 Points of Weakness. After PESTEL categorisation, the Opportunities and Threats have been grouped into three major strategic categories: "New market trends", "Sector financing" and "Structure and functioning of the value chain". The SWOT analysis exercise led to a 1,647-cells matrix with 729 cells matching Opportunities or Threats with relevant Points of Strengths or Point of Weaknesses. The identified item matches are described in Table 1 – Summary of SWOT Analysis.

Table 1. Summary of SWOT Analysis matching items

Total Cells	Total Matches	Opportunity/ Strength	Opportunity/ Weakness	Threat/ Strength	Threat/ Weakness
1,647	729	157	303	88	181

This approach has led to a reinforced and double-sided investigation of the SWOT Analysis items. From the point of view of the internal natural resources, the sector may be regarded in an optimistic way. However, as the SWOT analysis has shown, the bottlenecks prevail. With the partial exception of wine, the sector is not competitive and not very efficient. Apart from one company, Plantaze, the sector is weak and finds it difficult to stay on the market alone until the level of competitiveness and efficiency has improved; because of the poor technology and organisation, the sector is far from achieving the opportunities provided by the new market trends (pillar one in the SWOT analysis strategic categories) and furthermore faces the risk of being defeated by the threats the new market trends pose over producers and traders as the sector has insufficient strengths to tackle these threats. However, a deeper investigation shows that at this stage, the sector can find attractive opportunities for development coming from the tourism sector and a global interest for the environment and environmentally-featured food products.

The second pillar of strategic categories confirms on-field observations that the financing of the sector is a serious constraint, as the farmers lack basic financial resources and the sector cannot oppose sufficiently *to the threat* posed by the low interest of banks and financial institutions in agriculture, as they prefer investing in tourism or industrial enterprises. Indeed, crediting producers or traders is considered to be risky, so no financial resources are available in a critical amount to further develop state-of-the-art technology for producers and processors. The numerous and significant weaknesses of the sector do not contribute to increasing its appeal to banks, thus reducing the potential impact of the available EU funds, as the permanent difficulties in self-financing that farmers usually find seriously diminish the possibility of accessing them. As a consequence, farmers do not invest or even prefer stay in a "grey economy" status, perceiving this as more protective (although this may be true in the short-term only).

The examination of the third pillar of the SWOT categories "Structure and functioning of the value chain" offers a clear description of a sector that can neither benefit from market opportunities nor is capable of tackling imports, this being exposed to the risk of seeing imports growing fast. In fact, weaknesses constantly prevail in all Opportunities and Threats that are included in this strategic option, with particularly emphasis on those that refer to export opportunities and to the development of a profitable domestic market. The poor level of organisation and technology at all stages of the chain, the reduced competitiveness and the low efficiency of the sector generate enough points of weakness to make the sector extremely weak.

4. The major problems

According to the SWOT Analysis, we may identify the following major problem areas:

Inadequate inputs and range of horticultural varieties. Prevailing varieties are old and not suitable for demanding markets. Varieties of vegetables such as potatoes, tomatoes, cabbages and of fruit (apples, cherries, peaches, nectarines, etc.) should be adjusted to the market's needs. For this reason, we welcome the recent endorsement of the International Union for the Protection of New Varieties of Plants (UPOV) that Montenegro has completed and will allow for an easier introduction of modern fruit varieties. As for vines, the SWOT Analysis shows that the market acceptance of autochthonous varieties is good; keeping a focus on traditional vine varieties is therefore strongly recommended. In terms of with agricultural inputs, we identified the problems of seed prices and quality, but problems with availability and supply assortment are also not negligible. In addition to seeds, farmers find problems in sourcing fertilisers, seedlings and protection products. SWOT analysis also discovered specific problems with plant protection related to effectiveness, i.e. the quality of plant protection products and the availability and price of and level of knowledge about these products.

Inadequate growing techniques. Generally speaking, improving Montenegro's competitiveness in fruit and vegetable exports requires changes in the production system, including the implementation of new techniques and machinery, irrespective of the types applied. Two other necessary elements here are: 1) the extension of the vegetable season not only by using new cultivars, but also by means of various techniques of implementation (hotbeds, greenhouse and plastic tunnels, etc.); 2) setting up anti-hail nets above orchards and plantations to ensure less vulnerability to weather conditions.

Fragmented production. The fragmentation of farms along with the small average surface area of farm plots is a big obstacle to raising competitiveness with regard to both the quantity and the quality of production as well as farmers' ability to use their buying/selling power to reduce production costs and increase incomes. Producers are poorly linked, both vertically and horizontally. Absence of crucial connections

among producers is a consequence of associations that are underdeveloped or do not exist. While a number of co-operatives and associations have been registered in the past few years, they are not operational and do not apply basic principles of co-operative by-laws. Many organisations exist, but since they do not serve the interests of their members, no progress has resulted overall from farmers' attempts to benefit from joint activities.

Fragmented marketing. New demands made by the market have been a huge challenge to all value chain participants. Over the past 20 years, attempts have been made to follow trends and fulfil market and production demands on all levels, also with the support of international projects. Unfortunately, previous linkages have ceased to exist and need to be renewed. Wine producers have a limited market but still are capable to sell their limited production. On the other hand, the sale of fruit and vegetables is a major constraint, as irregular and no guaranteed purchases are dominant in this area of sale. Fruit and vegetable producers are faced with a saturated market that creates difficulties further along to sell the entire production, with additional bottlenecks coming from low prices, lack of demand, unfair internal competition and inadequate packaging. As the sector has had to deal with many other priorities as well, marketing and promotion have usually been left aside.

Shortage of refrigerated warehouses. An extension of the production season is also constrained by a shortage of adequate storage opportunities. Because of the lack of proper storage, some locally grown and traditionally produced vegetables must still be imported out of season as fresh goods. With proper storage, products such as carrots, parsley, celery, onions, and many others can be kept and sold with insignificant quality changes throughout the year. Also, storage inadequacy and the lack of storage space represent major constraints which would preferably be solved by additional and adequate storage capacities, although in these cases, financial shortcomings arise.

Lack of distribution/consolidation centres. Such centres should have modern technology for grading, sorting and packing fresh produce (including calibrators, floating systems, packaging, and more). An additional value of these centres will be that individual producers and co-operatives would be able to sell or deliver their products there to be washed, packed and prepared for the final buyers.

Need to introduce HACCP and Global GAP standards. It is vital for the sector to adjust farm management practices to conform to Good Agricultural Practices (GAP) including Integrated Crop Management techniques and traders and processors to adopt HACCP and GMP. Farmers, as well as some processors and traders, remain unaware of the real need for this. There is a need for dissemination of information and training about farm management, product processing and handling, food safety, international standards and certification throughout the Montenegrin farm market chain.

Inadequate packaging and labelling. Improving packaging and labelling is a very important step in the whole chain for the competitiveness of final products. While the EU market demands quality certified packaging, there are very few local producers using certified and quality food packaging that are applying safety standards. In addition, retail vs. bulk as a predominant packaging practice needs to be introduced to a greater extent.

Limited technical knowledge. Although Montenegrin farmers have a long tradition in horticultural and grape production, technical knowledge is at a low level, especially as regards the use of modern technologies. Farmers need capacity building in production, market-oriented production planning, post-harvest management, quality control and sales and marketing. Another level of technical assistance is needed for farmers' organisations.

Poor managerial skills of farmers and producers' groups. Both farmers and producers' groups have limited knowledge of farm cost management and of sources of finance (bank programmes and credits; the Ministry of Agriculture's loans and subsidies). Problems with production organisation are often reflected in the lack of adequate workforce, as the SWOT Analysis points out.

High costs of on-farm investments and the credit needed to make them. Examples of widely needed investments may include irrigation systems, mulch foil, rotating tills, narrow platforms, hail and frost protection, calibrators, packaging machines and cold storage units. The loan arrangements offered by financial institutions feature high interest rates and unfavourable conditions.

5. Conclusion and guidelines for strategy

The general objectives that should be achieved for the development of the sector, consistent with the above market drivers, are identified as follows:

- Modernise agriculture to optimise productivity within limited resources, also to reduce costs through investments in the modernisation of the farm on an individual basis and in terms of the organisation of producers for better marketing and improved production technology.
- Enhance the quality of final outputs and ensure food safety through improved technology, management and quality control at a primary production level and in the post-harvest stages of the chain (distribution, logistics, processing).
- Optimise the utilisation of resources to create better framework conditions for the production and marketing of value-added product ranges and niche products also based on local biodiversity, including branding and characterisation of products, such as GI Geographical Indication products or labelling of origin.
- Develop potential revenues, with an emphasis on improved marketing through market differentiation and the promotion of added-value products for niche markets and tourism.
- In order to benefit from trade liberalisation and from the process of integration into the EU and reach the two major targets (import substitution and exports to

the regional market), the Montenegrin sector has to increase competitiveness to shift from the current status of commodity-oriented supply to a more attractive high-value product supply. If we look more in detail at the opportunity provided by the substitution of imports of fruit, vegetables, potatoes, wine and supply materials by domestic production (SWOT), which is considered to be one of the major objectives for the sector, we have a first confirmation of the low level of competitiveness of the sector, as weaknesses strongly prevail. The Montenegrin sector is very fragmented with a high number of subsistence and semi-subsistence farmers and traditionally small field sizes.

- In more detail, the volume of domestic horticultural production has limited dimensions if compared to the global markets and major competitors (the wine sector, too, is small in comparison to major global players). This is a weakness that makes price formation more exposed, even to limited variations of supply, and requires strong market differentiation strategies. The working capital available to farmers, traders and processors is limited, producers do not have own capital available for necessary private contributions to investments and it is difficult to receive credit lines for both investments and working capital at reasonable interest rates. Also, the small-scale sector lacks marketing skills and capacities. Production for self-consumption or for the local market reduces the efficiency of the sector, the size of the potential market and the impetus to innovation, so that the supplier structure is underdeveloped, which leads to higher prices and suboptimal quality of supply materials. The small plots of land additionally reduce specialisation and average productivity and private producers and processors have difficulties in delivering consistent quality and quantity to both domestic and export markets. The accession experiences of Austria and Hungary show, in opposite ways, the importance of supply chain agreements, farmers' co-operation and the co-ordination of the sector in order to increase efficiency and competitiveness for the adequate development of the sector and its capacity to compete at an international level within the EU enlarged market.

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ECONOMIC EFFECTS OF FAIRS – A COMPLEX APPROACH

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Abstract: A complex economic evaluation of fairs / exhibitions can be considered as a novelty in the current literature. In this novel approach, each stakeholder group involved in a fair is evaluated in numerical terms, taking into account the specific cash inflow and outflow categories of that group. The net cash flow is considered as the economic value since it filters out the accumulations. Adding together all the categories, the so-called complex economic value and effectiveness is established regarding the fair surveyed. A numerical model entitled KAVA was developed in order to carry out the calculations for the complex economic effectiveness of the fair. A practical example of using the model is also shown in the paper.

Key words: fair, economics, cash flow, model, effectiveness

Introduction

fairs and exhibitions can be considered as one of the oldest means of marketing, looking back over several thousand years' past. Many authors have dealt with the evaluation of these events, examining them from several viewpoints; however, fairs / exhibitions have not yet been evaluated from an economic viewpoint in a complex way, taking into account the environment, region or settlement in which they are held. In this article the author presents a model that attempts to answer the questions above in a complex way, providing numeric figures regarding the economic effectiveness of a fair. The acronym of the newly developed model is KAVA. In this paper, the author presents the theoretical background of the KAVA model and one practical example.

Literature review

an array of publications have dealt with the evaluation of the effects of fairs / exhibitions in marketing literature. The approach taken by the authors of such publications is mainly qualitative, though occasionally quantitative, too. The main characteristics of the existing publications are that they investigate one or more objectives from the view of the stakeholders of fairs, and generally analyse them independently of their environment / region / settlement. The publications cited below, however, include invaluable components for creating a more complex model, since the different approaches used by previous authors can be usefully incorporated into a new model. For the figures on economic effectiveness, Nabradi's (2008) article provided the main guidelines, while in connection with consumer behavior, the method offered by Csapo (2006) was followed. In creating the KAVA model, the publications of the authors listed below have been especially invaluable: Ali-Knight (2008), Arany (2002), Bakos (2004), Biro (1994), Csizmadia (2004), Farago (2005), Fenich (2008), Gauder (2006), Gyarmati (2005), Jarasi (2004), Kozma (1999), Masterman & Wood (2008), McDonnell (2008), Robinson & Long (2008), Rogers & Davidson (2008), Rutherford & Goldblatt (2008), Shone (2008/a, 2008/b), and Tomecsko (2003). In addition to those publications, two further publications which did not contain the authors' name(s) also proved useful: Anonymous (2004) and Vatel Team (2006).

The main publication inspiring this paper / upon which this paper is based was that of Varga & Karpati (2006), in which the authors described their evaluation of fairs' stakeholders quantitatively in a complex way. This article served as a basis for creating the complex economic model of fair evaluation, named KAVA after the initials of the authors.

Main approach of the KAVA model

The main approach of the KAVA model is to separately evaluate stakeholders' roles in a given fair economically, then summarising them to determine the complex economic value of the fair. Based on Varga & Karpati's (2006) article, mentioned above, the main stakeholder groups involved in a fair can be distinguished, as below:

a) organiser
b) exhibitor
c) professional buyer
d) expert company
e) individual expert
f) future expert / student

g) ordinary visitor / layperson
h) region / settlement (the laughing third)

The list above contains all the stakeholders who are in some way connected financially to a fair / exhibition, and whose role can therefore be calculated in monetary terms linked with an event. In the KAVA model, each stakeholder has three money flow categories, as below:

- money inflow for the given stakeholder, called 'yield value' in the model
- money outflow for the given stakeholder, called 'cost value' in the model
- net cash flow, calculated as money inflow minus money outflow, called 'economic value' in the model

The task, therefore, is that the yield and cost values have to be measured for each stakeholder separately, and then used to determine the economic value by means of subtraction. In using the model, we have to take into account that there are numerous values which for one stakeholder might mean money inflow, while for another might mean money outflow. Let us take the example of the admission fee: this represents a cash outflow for the visitor, but a cash inflow for the organiser. Due to this characteristic of the model, calculation of the yield and cost values contain accumulations. The method of calculation, namely subtraction of the cost from the yield value to ascertain the economic value, however, filters this accumulation out of the model. In the KAVA model, therefore, the economic value figure shows the real monetary value of the fair for a stakeholder group, which can be either negative or positive, due to the "net characteristics" of this figure. When we summarise the economic values of all the stakeholder groups by their sign and absolute values, the complex economic value of the fair / exhibition is determined.

In the following points, the theoretical method for the determination of economic values in case of each stakeholder group is shown.

Determination of the stakeholders' economic values

Organiser

a) Determination of the yield value

The yield value for the organiser can be determined by addition of the factors below:

- income from the inner and outer space sold
- income from equipment rented out
- income from the admission fee
- state and local subsidisation
- collected parking fee
- other cash inflows

b) Determination of the cost value

The cost value for the organiser can be determined by adding together the cost categories listed below:

- cost of the hired space (inner and outer) and the equipment hired
- cost of exhibition construction, such as cost of logistics, cost of hired labour and premium wage for own labour force
- transportation, accommodation and meals for the labour force
- cost of security service
- cost of public utility and other public services
- public relations and promotional costs
- insurance cost
- any other cash outflow connected to the organisational activities

c) Determination of the economic value

As shown above, the economic value for the organiser of the fair / exhibition can be determined as a product of the yield value minus the cost value. This calculation is the same for each stakeholder group, so will not be shown in the paper from now on.

Exhibitor

a) Determination of the yield value

The yield value for the exhibitors can be determined by addition of the factors below:

- average direct sales at the fair
- expected potential sales surplus supposing N years' lasting positive effect of the fair
- potential savings due to the non-executed partner visits (because they are also on site at the same time)
- potential savings due to the non-executed competitor visits
- potential savings due to the non-executed visits to neighboring concentrated market-place (replacing effect)

b) Determination of the cost value

The cost value for the exhibitor can be determined by adding together the cost categories listed below:

- cost of direct sales at the fair
- surplus cost due to surplus sales as an effect of the fair (see the point above)
- booth and space hiring fee
- cost associated with equipment purchase or hiring
- hired labour cost, premium for own employees
- labour transportation, accommodation and meals cost
- PR and promotional costs

Professional buyer

a) Determination of the yield value

The yield value for the professional buyers can be determined through the addition of the factors below:

- potential savings due to non-executed partner visits (because they are also on site at the same time)
- value of savings due to special fair discount
- "professional welfare effect" due to the professional content of the fair

b) Determination of the cost value

The cost value for the professional buyer can be determined by adding together the cost categories listed below:

- travel cost
- cost of accommodation and meals
- admission fee

Expert company

a) Determination of the yield value

The yield value for the expert company can be determined through the addition of the factors below:

- potential savings due to non-executed partner visits (because they are also on site at the same time)
- "professional welfare effect" due to the professional content of the fair
- expected direct expert income connected to the fair

b) Determination of the cost value

The cost value for the expert company can be determined by adding together the cost categories listed below:

- travel cost
- cost of accommodation and meals
- admission fee

Individual expert

The methodology as regards individual experts is the same as for the expert company (see above). It is worthwhile creating a new category, however, because individual experts are generally connected to far fewer partners than are expert companies.

Future expert / student

It is novel to create this category among stakeholders, since no publication has dealt thus far with students of higher education as a separate group. For them, the professional experience acquired at a fair can potentially be utilised during their studies, which may lead to higher grades, a higher scholarship and as a result of that, potentially to a higher salary after graduation.

In the cash outflow side, in addition to the admission fee one can count on travel and subsistence costs in case of visiting students.

Ordinary visitor / layman

The ordinary visitor / layperson does not raise any professional question in connection with the fair / exhibition, but visits this event basically for its entertainment value. For them the "money inflow side" can be determined as well-spent leisure time or interesting entertainment, a hypothetical value which can be compared to the cost of the admission fee. We can create several categories among the laypeople, from those who greatly enjoy the fair and evaluate its entertainment value equivalent to 10 times the admission fee, down to a category in which the people consider the admission fee as money lost. Market research is necessary in order to determine the category in which the visitors belong. A random sampling method is suggested in this case.

The cost value incorporates the admission fee, as well as travel costs and subsistence.

Region / settlement ("the laughing third")

The label "the laughing third" refers to the situation in which the settlement / region also makes a profit from the fair / exhibition, despite not working towards the goals of this event. In the following points, the main factors to take into account in this case are summarised.

a) Determination of the yield value

The yield value for the region / settlement can be determined by the addition of the factors below:

- number of non-local visitors and their average spending there
- surplus spending in the hotels including the potential extra "fair rate" in the region
- surplus spending on meals in the region
- surplus tourist tax income
- savings of local promotional cost due to the fair's "piggyback" effect
- potential long-term effect of increased number of tourists and their spending margin in the region

b) Determination of the cost value

The cost value for the region / settlement can be determined by adding together the cost categories listed below:

- cost ratio of the income categories listed above under point (a)
- surplus costs in the region in connection with environmental protection, cleaning and security services
- higher surplus in accidents due to the increased number of visitors and the material loss caused by it
- higher criminal activity in the region and the material loss caused by it

Complex economic evaluation of a fair

The main yield and cost categories of the KAVA model have been described in the previous section. Due to professional considerations, both the exhibitors and the professional visitors can also be classified into 3 categories – large, medium and other (small) – based on the sizes of the companies in question. In each category, many inputs for the yield and the cost sides have to be determined in order to establish an economic value that does not contain any money accumulation. After determining the economic values of each category, they can be added together and the so-called complex economic value of the fair can be determined in one single figure.

As can be seen above, the KAVA model requires many numerical inputs. The inputs are classified into 14 groups,

and altogether 242 input figures are needed to run the model. The number of outputs totals 174. The most important output, however, is the total economic effectiveness of the exhibition including the valuefor the region in which the exhibition is organised.

These can be established through analysing the recent economic environment, but primarily by surveying the different stakeholders of the fair. The model can also be used for planning, too, when the planner uses expected figures for the future and WHAT – IF analysis to develop new scenarios. The "ideal" fair is a theoretical one at which all stakeholders have positive economic values. If one or more groups' economic values were negative or very negative, their long-term participation in the fair would be questionable.

Technically, the KAVA model is developed using the Excel programme, meaning that practically anybody can use this model for analysis or planning purposes.

Practical example

The KAVA model was tested on several exhibitions held / organised (?) by Varga in Hungary and Poland. The results of one Hungarian exhibition are shown below.

The main character of the OMÉK 2005 exhibition was agribusiness and food. It was held in Budapest (Hungary) in August 2005, and is considered the main agribusiness fair in the country. The total number of exhibitors is 600, of whom 25 were large companies (annual turnover: 50 Million USD +), 60 were medium-sized companies (annual turnover between 5 and 50 Million USD) and the rest were smaller exhibitors. The total number of visitors was 110,000, of whom 70,000 were considered non-professional visitors. The number of local visitors was 90,000. Out of the 40,000 professional visitors, 500 were considered large companies, 3500 medium-sized companies, and the rest were from other companies or individuals, including 2650 expert companies and future experts.

The main outputs of the model can be seen in Table 1.

As can be seen in Table 1, the total net economic value expressed in USD of OMÉK 2005 fair is close to 10 Million, calculated from the local currency of Hungarian Forint (1 911 576 thousand HUF) by the exchange rate of 200 HUF/USD, characteristic at the time of calculation.

The first column shows the calculated net economic value for each of the stakeholders involved in the fair by the KAVA model algorithm.

The second column shows the allocation of those values in percentage. Please note that due to the net value calculation, some figures are negative as the cost value for participation is higher than the possible benefits. In this case, small scale exhibitors seem to produce such values, making the summarised exhibitor value also slightly negative. At the same time, however, for the large exhibitors the economic value is quite positive. The same tendency can be seen in case of the professional buyers, too, where the large companies are the real beneficiaries of the fair. The real winner is the organiser, which gains nearly half of the net economic value. The other winner is the capital city Budapest itself, representing over 40 per cent of the total net economic vale, due to the increased demand for accommodation and entertainment. These two stakeholders represent about 90 per cent of the total economic value of the fair. This extremely high percentage was suspected so far, but never shown so clearly in a publication.

Table 1: Economic effectiveness figures of the OMÉK 2005 fair

Category	Economic Value in thousand USD	Economic Value allocation, per cent	Economic Effectiveness, per cent
Organiser	4680.6	48.97	461.14
Exhibitor: large	396.5	4.15	2.98
Exhibitor: medium-sized	4.1	0.04	0.09
Exhibitor: small / other	-439.6	-4.60	-12.56
Exhibitors together	-39.0	-0.41	-0.18
Professional buyer: large	622.5	6.51	149.10
Professional buyer: medium-sized	63.0	0.66	3.24
Professional buyer: small/other	108.0	1.13	1.40
Professional buyers together	793.5	8.30	7.86
Expert company	90.4	0.95	42.01
Individual expert	6.6	0.07	3.89
Future expert/student	14.9	0.16	19.60
Expert visitors together	866.4	9.07	2.73
Expert visitors and exhibitors together	5547.0	58.04	16.95
Ordinary visitor/layperson	19.0	0.20	1.09
Experts and visitors together	5566.0	58.24	16.15
Region/settlement ("the laughing third")	3991.9	41.76	246.01
Fair total	9557.9	100	26.48

The third column shows the figure of economic effectiveness for a given stakeholder, calculated as an economic value divided by the cost value and expressed in percentage. Any figure over 20–30 per cent can be considered as a desirable value, even taking into account the risk premiums as well. In addition to the organiser and the city, the large-scale professional buyers show a high value of over 100 per cent. The expert company and future expert categories show acceptable results, but for other stakeholders, the exhibition is not very economically efficient. Surprisingly, this is true for the large exhibitors, as well, where the economic value itself was quite high anyway. This can be explained by the high cost of participation, which pushes down the effectiveness figure to 3 per cent. The small exhibitors seem to be the real losers of the fair, a phenomenon observed no only in this case, but in every fair we examined by Varga, as well.

As shown, the KAVA model visualises the economic values *quite spectacularly (sounds strange for an academic publication. 'Very clearly'?)*and incorporates data from all the stakeholders involved. In this sense, the model can be considered unique in the literature so far. Of course, the usefulness

of the model is a function of the reliability of the input data, meaning that they must be established through intensive and careful market research as well as auditing as regards the fair and its environment.

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THE MARKETING STRATEGIES OF SERBIAN HONEY PRODUCERS

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Abstract: Serbian honey producers are exposed to the increased international competition of recent years. To face up to the new changes, producers are progressively using diversification strategies, such as direct sales and production diversification. The direct sales strategy allows the producers to increase the product added value, while diversification aims to offer new products to the consumers.
The aim of this paper is to analyse the honey marketing strategy of Serbian honey producers. The first part of the paper analyses the structure of production costs, production performances as well as the determinants of the honey supply. In the second part of the paper, analysis is focused on the determinants of direct sales. Finally, in the third part of the paper, diversification strategies are discussed.
The data for this research has been obtained on the basis of a representative sample consisting of 84 Serbian honey producers interviewed in 2011 and 2012. The results show that the Serbian honey producers operate with more or less similar production costs and with production performances that do not differ significantly. They use direct marketing for two reasons: firstly, it affords personal contact with consumers, and secondly, they aim to decrease the transaction costs, thereby keeping a higher share of the product's final value. Offering new products to consumers is an attempt to create additional product demand.

Key words: marketing strategy, Serbian honey producers, direct marketing, diversification

Introduction

The products from bees include honey, propolis, royal jelly, pollen, beeswax and bee venom. The market definition in the case of bee products is relatively simple, because there are no similar or related products that constitute relevant competition, which facilitates analysis.

Honey is a high-calorie, easily digestible product that is used both as food and as natural remed**y.** Honey is used in the preparation of cosmetic products such as soaps and creams, but also for the preparation of pharmaceutical products that are applied directly to wounds and burns. It helps against infection, improves tissue regeneration and reduces scar tissue in its raw, unprocessed form.

Pollen is applied in the case of prostate problems, as well as for prostate cancer and allergies. The application of pollen as a supplement in animal feed led to an increase in the weight of pigs, chickens and laboratory cultures of insects.

At the moment, the production of propolis, pollen, royal jelly and bee venom in Serbia is negligible and cannot be considered as providing a serious supply on the market, although excellent conditions prevail for their production and the potential demand is high.

The indirect benefits of bees are reflected in the pollination of flowering plants. This has significantly greater value for the national economy than the bee products themselves. The benefit from pollination, primarily in the case of agricultural and industrial plants, is 10-15 times higher than the direct benefit of the honey and other bee products. Experts have calculated that the value of increased production and product quality of many fruits, field crops, vegetable crops, and meadow and forest plants caused by the work of bees is more than 30 times higher than the value of all bee products.

The natural conditions, moderate continental climate and abundance of flora provide excellent conditions for beekeeping in Serbia. Beekeeping is an activity that has existed in Serbia for a very long time. According to the usability of important pastures, there are two areas in Serbia which are especially important for beekeeping: the area of Vojvodina, where rapeseed, linden and sunflowers grow, and the area of Serbia which lies to the South of the Danube river, where there are acacia and meadow pastures.

According to the official statistics, there are about 31,000 beekeepers in Serbia with approximately 430,000 hives, or about 14 hives per beekeeper. In the sample that was used for the research analysed in this paper, the average number of hives per beekeeper was 166. In Europe, the number of hives per beekeeper varies from about 10 in Germany up to 54 in Greece (http://www.beekeeping.com/).

The total production of honey in Serbia reveals a slight increasing tendency and amounts to about 4000 tons, of which about 90% is produced in Central Serbia, and the remaining 10% in the Province of Vojvodina. In contrast to the clear tendency of the total production growth, productivity does not show a clear trend, but rather stability.

On average, 13kg of honey is obtained per hive in Serbia, while in our research sample, the average was 30kg of honey per hive. The European average is about 25kg per hive.

Of the total number of beekeepers, 60% have an apiary with 20 bee hives, about 30% of beekeepers have between 20 and 50 hives, around 7% of beekeepers have 50-100 hives, while only 3% of beekeepers have more than 100 hives. Increased unemployment in the country has influenced the increasing number of people involved in beekeeping, either as primary or as an additional job.

The largest number of beekeepers in Serbia is engaged in beekeeping as a hobby (82%), suggesting that beekeeping is not their main source of revenue. For some 16% of beekeepers, beekeeping represents the source of additional revenue, while for only 2% of beekeepers in Serbia, it is the sole source of their revenue.

About 9,000 beekeepers are members of 173 associations that make up the Union of Beekeeping Organisations of Serbia (UBOS).

To use pastures more efficiently, it is necessary to move the hives. Every year, beekeepers increasingly utilise trucks, buses and trailers with built-in hives for the moving of hives or use the loading-unloading system. In Serbia, there are over 800 vehicles with built-in hives, but an increasing trend of pallet-moving the bees can also be observed.

Efficient beekeeping necessitates both modern hives and contemporary supporting equipment and accessories. Nonetheless, some beekeepers – including some of those in Serbia – continue to use traditional hives**.** Beekeepers in Serbia use about 25 types of hives, of which 4 standard ones exist: LR, DB, AZ, and Položka hives. Over the past 20 years, the Farrar system has also appeared in the country.

Serbia has many hilly-mountainous regions where agricultural production is still practised in traditional forms, and with a low population density, providing good conditions for organic beekeeping.

Also, the national parks represent convenient areas for the application of organic beekeeping. Their habitats have been analysed, controlled and partially protected from degrading human activities. As the national parks lie mainly or exclusively in the hilly-mountainous regions, the traditional forms of economy have dominated in these areas.

Beekeeping development has resulted in an increased demand at the market for the bee swarms. The market turnover of bee swarms is performing in packages, i.e. with a standard package aiming at 1.2 kg of bees and the queen bee, or with bee frames, a package usually consists of 5 frames of which 3 contain the bee brood and 2 contain honey. The demand for these package swarms occurs in the season when the acacia pastures are in bloom.

Materials and methods

For the analysis of Serbian honey producers' marketing strategies, a survey was conducted among the honey producers during an exhibition fair which is held every year in Belgrade and which is the largest exhibition of its kind in Serbia. Testing was performed on two occasions in 2011 and 2012. The total sample size was 84 respondents. The questionnaire was of the closed type, where respondents were asked the questions about the costs of production, method of production and the main factors that determine the supply and competition. They were also asked questions about the marketing channels, the reasons for the selection of specific channels, and their strategies of differentiation. The interviews were conducted face to face. This paper presents the first results obtained using descriptive statistics and SWOT analysis.

Results and discussion

According to some estimates, professional beekeeping in Serbia necessitates that the producer has over 150 hives; and number of beekeepers working to this capacity in Serbia is engaged in a mild upward trend. In our sample, two-thirds of the beekeepers surveyed had more than 150 hives. According to the current market price for honey and the honey production costs in Serbia, those producers can be regarded as professional beekeepers.

The economic analysis started by looking into investments and annual operating costs. The level of investments depends on the number of hives. It was assumed in the research that investment per unit is equal regardless of the number of hives with which production begins.

Classification of the producers was done according to the results of the survey and on the basis of the literature. The producers responded, among other things, to questions about the number of hives at their disposal, the activities they deal with as well as the annual expenditure of time invested in honey production. Annual working hours per producer were calculated on the average level of 2,500 hours.

The group of professional beekeepers included those beekeepers whose only occupation is beekeeping and who can earn an income from it which is comparable to that which could be achieved in other sectors and jobs.

According to the above-mentioned criteria, on average terms, the hobby novice beekeeper has 20 hives (S1), the advanced hobby beekeeper has 50 hives (S2), the semi-professional beekeeper has 100 hives (S3), while the professional beekeeper has 150 hives (S4). The amount of investment per hive depends on the purchasing conditions which are described by scenarios A, B and C. Each of these beekeepers, no matter which category he/she belongs to, can be found in the situations described in scenarios A, B or C (Figure 1). The factors which determine the level of costs are dependent on the beekeeper's strategic commitments and negotiating skills.

For scenario A, very favourable supply conditions were assumed, while scenario B assumed the usual market conditions. Scenario C supposed a very good quality of equipment and exceptional conditions of procurement. It is expected that advanced beekeepers use good quality hives, swarms and other materials, and therefore have higher initial investments. At the same time, the advanced beekeepers achieve greater honey production per hive and therefore have the higher revenue (*Ferencz and Notari,* 2008; *Marinković and Nedić,* 2010).

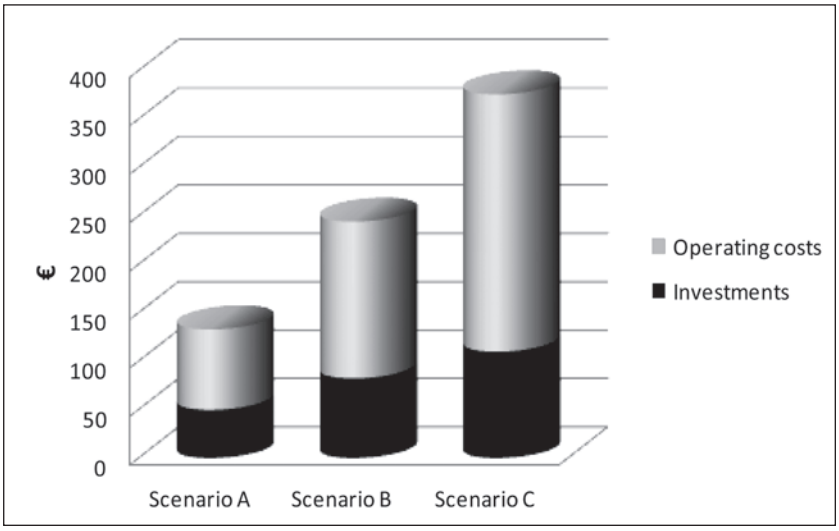

Figure 1: Investments and operating costs

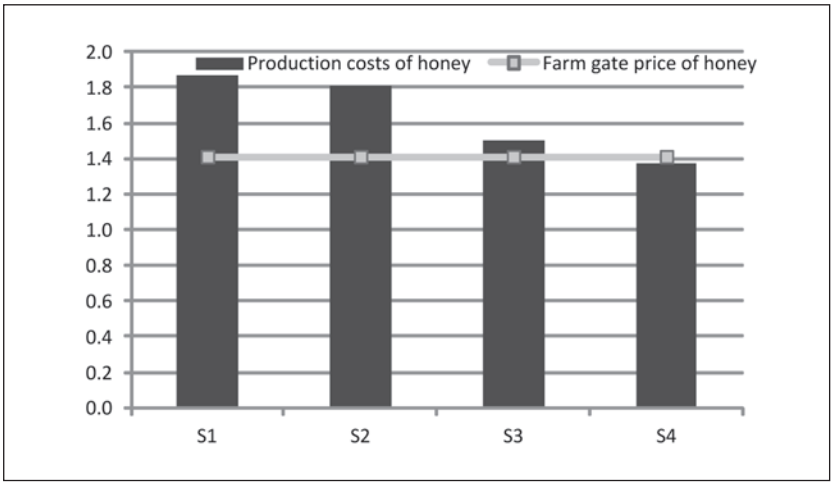

Figure 2: Comparison of the production costs and farm gate price

The research showed that the advanced beekeepers have lower operating costs, which amounted to € 1.373 per kg of honey. The hobby novice beekeepers have costs amounting to € 1.872/kg. At the same time, the advanced beekeepers have a higher quality product and achieve higher selling prices than other beekeepers.

It was presumed that the market retail price of honey amounts to € 3.744 kg. After deduction of the transaction costs, a farm price was obtained that is acceptable in the market sense and which amounts to € 1.411/kg in the normal production year.

By comparing the costs and prices it can be seen that only the beekeepers who have more than hundred hives have a positive result, while the others make losses (Figure 2). The following table shows the structure of transaction costs.

In elaboration of the trade calculation it was assumed that regardless of the size of production, the producers are operating in the conditions of perfect competition, while the price is a given as an indicator. All expenses incurred in the transaction of the product (from the producer to the customer including VAT) have been deducted from the retail price.

Large beekeepers with over 100 hives and beekeepers involved in pallet beekeeping have mostly LR hives. Beekeepers with fewer hives and the stationary ones have DB hives, while beekeepers with hives built in to transport vehicles have AZ hives. Other types of hives are less frequent.

Most of the inputs are purchased from the domestic market. The only exceptions are some of the protective chemicals that are imported. Complete packaging material is produced in the country at affordable prices. The markets for professional services and marketing services are developed, so beekeepers are provided with everything they need.

The producers usually sell their products primarily on the domestic market and thereafter on the foreign markets. On the market, honey is sold most often in liquid form, less often as honeycomb. The trade of honey is not organised in a way which satisfies both producers and consumers. The retail prices in Serbia are at the level of European countries or above that level.

In recent years, there is a growing interest in beekeeping in Serbia and as a result, an increase in the level of honey production can be expected as well as an increasing supply of honey and related products on the market.

Differentiation among the small producers can also be expected. Some of them will disappear from the market due to the expansion of the professional beekeepers as well as their inability to meet the legal requirements set by

Table 1: Trade calculation (€/kg)

A	**The retail price for the end customer**		**3.744**
B	**Commercialisation of honey**		**2.333**
Minus	VAT (18%)	0.624	
=	Retail price without VAT	3.120	
Minus	The retail margin (20%)****	0.520	
=	The purchasing price of the retail trade	2.600	
Minus	The wholesale margin (15%)	0.339	
=	The purchasing price of the wholesale trade	2.261	
Minus	The packaging services***	0.226	
Minus	Packaging - commercial **	0.624	
C	**The honey price at the apiary (A-B)**		**1.411**

* Data on the operating costs obtained from the beekeeper
** Jar, cover, label
*** Packaging services: for the hobby beekeeper 10% and for the professional one 7% of the wholesale honey price per kg
**** Average margin in the small retail facilities

Source: Authors' calculation

the state, while the others will progress into the category of professional beekeepers.

The role of middlemen should also be mentioned, as they have a negotiating advantage in the trade with small producers, resulting in lower prices for the producers (*Mogno et al., 2007*), which usually amount to about half of the honey retail price (*Dukic et al., 2003*).

Unfair competition for beekeepers on the domestic market is also exacerbated by artificial honey producers. It is sometimes the case that the consumer is convinced that he or she is buying a quality honey until its physical and chemical analysis, as it is possible to produce honey from pure diluted sugar, which leads to a reduction in quality. In this domain, an adequate response by the state is required in order to prevent and such unfair competition, as well as adequate categorisation of products in order to bring about transparency about the quality of honey and its origins.

On the international market, the biggest competitor is honey from China. The advantages of the Chinese honey are in its large quantities and very low selling prices. In terms of quality and taste, this honey is far below that of the honey produced in Serbia. Chinese honey is extremely price-competitive in Europe. In this segment, producers not only from Serbia, but also from other countries in the region and EU countries are unable to compete with these prices.

Competitive products for honey are also the products used in large quantities in the confectionery industry (such as brown and white sugar).

As for the other bee products such as propolis, royal jelly, pollen and the like, there are of course no substitutes for these because they are products whose qualities are impossible to recreate in a synthetic way.

The strategy of differentiation of products is largely determined by the regional origin of honey. For example, the producers from Homolje (Eastern Serbia) enjoy a special reputation among consumers because this area is considered as the ecologically cleanest region. In connection with regional differentiation, differentiation by type of honey is also related to the primary nectar and pollen used for honey production; the main categories are meadow honey and acacia honey. The strategies of differentiation and highlighting the origin of the honey brings the benefit of higher selling prices (*Ostojic et al., 2011*).

To avoid the intervention of middlemen, honey producers increasingly use direct marketing, thereby keeping most of the price for themselves. Like this, producers also have direct contact and exchange of information with their customers (*Aguglia and Salvioni, 2010*). In addition, a relationship of mutual trust can develop, resulting in increased customer loyalty. Most of the surveyed producers indicated that they have customers to whom they have been selling their products for many years.

Based on the SWOT analysis, it could be concluded that one of the weaknesses is the low purchasing or selling price, which can be turned to an advantage by the producers‘ assumption of a larger role in the marketing of the products, which will eliminate the threats of a large number of traders who are presenting themselves as producers to the end consumers.

The SWOT analysis shows the following results:

Strengths	Weaknesses
• Favourable climatic conditions • Constant education of beekeepers • Awareness of the medicinal qualities of honey • High quality of honey • Invisible marketing	• Seasonal buying of honey • Low purchasing (selling) price • Strong competition in hypermarkets • Inconsistency in the quality of honey
Threats	**Opportunities**
• A large number of retailers who present themselves as producers • Imports of poorer quality honey from other countries • Lack of long-term policies at the national level • Poor information among end-users on the quality of honey (low demand for the crystallised honey)	• The protection of geographical origin of honey • Cooperation between beekeepers and organising of associations aiming at joint appearance of the small producers in the market • Differentiating of the products (honey with walnuts, hazelnuts…) • More homogeneous quality of producers from certain area/ region • Establishment of concepts that will influence the sustainable beekeeping development in the areas most favourable for this production

Conclusion

On the basis of the research presented in this paper it can be concluded that most of the honey producers in Serbia have similar operating costs and that according to production performances, those producers with a large number of hives who provide higher quality inputs and have higher quality products can be clearly distinguished.

Serbian honey producers use direct sales in order to increase the generated added value and to obtain direct contact with customers. Reducing transaction costs is a strategy that is applied regardless of the number of hives that producers have.

Differentiation strategies are based on the geographical characteristics of the area, as well as on the flora and fauna represented in the particular area. Also, differentiation can be made in terms of the type of nectar and pollen from which the honey originates.

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Project number TR 31034 „Defence of the biological threat to the safety/quality of food of animal origin and control measures from farm to consumer“. The research period of this project is 2011–2014.

Project number 179028: “Rural labour market and rural economy of Serbia – diversification of income and reduction of poverty”. The research period of this project is 2011–2014.

Project number III46009, subproject 460097III: “Improvement of technological processes in the production of bees, honey, wax and pollen”. The research period of this project is 2011–2014.

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THE INFLUENCE OF DIRECT SUPPORT UNDER COMMON AGRICULTURAL POLICY ON FARM INCOMES IN POLAND

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Abstract: The main objective of the paper is the analysis of changes on the level of income of agricultural producers, which took place in Poland in the early years of the accession to the EU, as well as a determination of the scale of the impact of financial support under the Common Agricultural Policy on the farm income situation.
Poland's membership in the EU gives rural farms opportunities to improve their economic situation. Financial aid, mainly in the form of a direct payment, has been the main factor determining the economical status of rural farms, whilst the other income making factors, such as improved productivity and increased agricultural production have played a much smaller role.
The increase in revenue has enabled farmers not only to increase current expenditures, but also to carry out modernization efforts, which will determine the future economic and structural situation of the Polish agricultural sector and its competitiveness. However, a strong differentiation in terms of the economic situation of rural farms according to their size and specialization in production was also noticed. As a result, there is a still large number of farms in which the revenues received by farmers are insufficient to assure them adequate life standard. Therefore such farms are not able to both develop and invest. Only economically strong rural farms with high production potential have such opportunities, meaning that EU support will never be able to fully minimize the effects of small-scale production or to offset the insufficient efficiency and productivity of production factors.

Key words: farm income, direct payments, CAP, financial support

Introduction

Polish accession to the European Union changed economic conditions in the Polish agricultural sector significantly. Economic transformations taking place in the first years of integration helped to improve the economic situation of farms and contributed to a marked increase in the income of agricultural producers.

Agricultural income is one of the main economic categories expressing the essential purpose of the production activities of a farm (Zegar, 2001). The standard of living of a farming family depends on the amount of income earned by the farmer, as well as the possibility of the development of a farm (its expanded reproduction), including investment and modernisation activities (Musiał and Mikołajczyk, 2004).

The amount of agricultural income, as opposed to the income of employed persons, varies greatly between different groups of farms. This phenomenon results not only from the differences in the resources of human capital and material production capacity of a farm, but also from the effectiveness of management and environmental conditions (Zegar, 2001). The buffer that mitigates the varied profitability of agricultural production is composed of the mechanisms of the Common Agricultural Policy (CAP), one of the main goals of which is to ensure an adequate standard of living for the agricultural community, in particular by increasing the individual earnings of persons engaged in agriculture. The main instruments of this policy include direct payments to farmers, which significantly improve the income improvement of the entities in the agricultural sector. The level of income generated by agricultural producers is also dependent on the value of manufactured products, the level of expenditure incurred for the production, as well as the relationship between the prices of agricultural products, and the prices of means of production (the so-called "price scissors"). In the long run the income situation of farmers is determined by the production potential of a farm as well as the efficiency of management of available resources (Józwiak, 2011).

Farms, as market participants, have different scales of efficiency of the conducted activity. This factor is a major source of competitive advantage, providing a farm with a greater share in the income generated in the agricultural sector, better conditions for development, as well as facilitating operation and keeping its position on the market. This diversity is also a key factor in the structural changes in agriculture (Niezgoda, 2009).

Materials and methods

The main objective of this study was to analyse changes in the level of income of agricultural producers that took place in Poland in the early years of the accession to the EU, as well as to determine the scale of the impact of non-market support under CAP on the income situation of farms.

The analysis used the relevant literature, secondary data from a sample of farms covered by the FADN (Farm Accountancy Data Network) and primary data obtained from surveys carried out directly on farms. The scope of the analysis is the period 2004–2010[1]. The secondary data was developed using the descriptive method and time series analysis. The analysis of primary data used the method of descriptive statistics. The results are presented in tabular and graphical form.

The basic economic category used for research was the income from a family farm, which is the economic surplus obtained in the course of farm's operations. It is a reward for a farmer for engaging in own production factors in the manufacturing process, i.e. labour, land and capital. The second variable was total subsidies on current operations linked to production (not investments) covering most categories of transfers of aid to farms under the CAP, with the exception of aid for investment and payments for the cessation of farming. This paper presents the results of research for all farms (average of the FADN sample), as well as farms grouped by economic size classes[2] and types of farming.[3]

Results and discussion

Studies have shown that the amount of cash inflows for total subsidies received by farmers depended mainly on the size of the farm, while its surface area was relatively less important. In 2004–2009, in the FADN sample, the annual aid amounted on average to PLN 12.3 thousand per farm. For the smallest farms (up to 8 ESU), the benefits were much lower than the average. In larger farms (over 16 ESU), subsides were significantly higher than the average, even 25- times higher on the largest farms (figure 1). The payment rate per 1 ha of agricultural land was inversely correlated with the size of the farm, i.e. the rate per 1 ha decreased with the increase in its size. In 2004–2009, nearly three-quarters of subsidies ware for small farms (representing ca. 90% of the study population), economically weak, but in dynamic terms their share decreased by nearly 9 percentage points to the benefit of the largest farms, while the share of the remaining entities in the structure of the EU support distribution has declined.

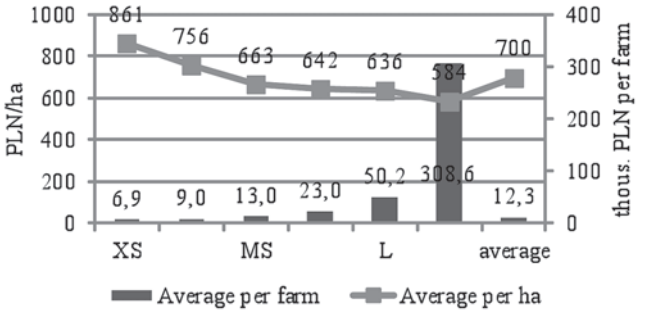

Figure 1. Average annual payment per farm and per 1 ha in 2004–2009 by economic size.

Source: Own calculations based on FADN data.

Although the level of aid to farms was not a direct result of the type of farming, in the breakdown by type of production there were also significant differences in the amount of benefits received (figure 2). In the period analysed, the highest amount of subsidies was given to entities specialising in field crops and the rearing of grazing animals, which resulted primarily from a much larger area of agricultural land in these farms. The lowest benefits per farm were given to beneficiaries specialising in horticultural and permanent crops (orchards). Payments to farms with a predominance of mixed production, prevailing in more than half of the study subjects, were slightly below the average for the whole FADN population.

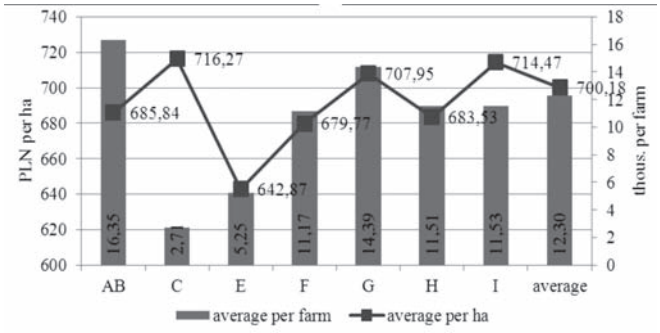

Figure 2. Average annual payment per farm and per 1 ha in 2004–2009 by types of farming

Source: Own calculations based on FADN data.

In the early years of the integration, there was a dynamic growth in the income of Polish agricultural producers (figure 3). In 2007–2009, the average income per farm was PLN 26 thousand, thus 10% higher than in the period immediately after EU accession in 2004. Among all the mechanisms of the CAP, the major determinant of farm income growth was the possibility of obtaining financial support in the form of subsidies to current operations linked to production (not

[1] Due to the change in methodology, the data from FADN for 2010 is not comparable with data for earlier years. Therefore, the analysis was completed using data only up to 2009.

[2] The FADN system distinguishes six classes of economic size of farms: very small (<4ESU), small (4-8ESU), medium small (8–16ESU), medium large (16–40ESU), large (40-100ESU), very large (ESU ≥100). One ESU corresponds to equivalence of 1200 EUR.

[3] Seven types of farming appearing in Poland: field crops (AB), horticulture (C), permanent crops (E), milk production (F), grazing animals (G), granivores (H), mixed production (I).

investments). In 2004–2007, the average rate of their growth was over 426%. Indicators relating to production, its efficiency and costs had a relatively weaker impact on the income situation of farms. The value of revenues increased in this time somewhat faster than the cost of manufacturing, which had been linked to technological progress, increased efficiency, replacement of more expensive means of production with cheaper ones, as well as improvement of the agrarian structure of farms. The increase in revenue was also due to favourable shaping of the price scissors index, as well as the favourable exchange rate of the euro, since this determines the actual amount of subsidies.

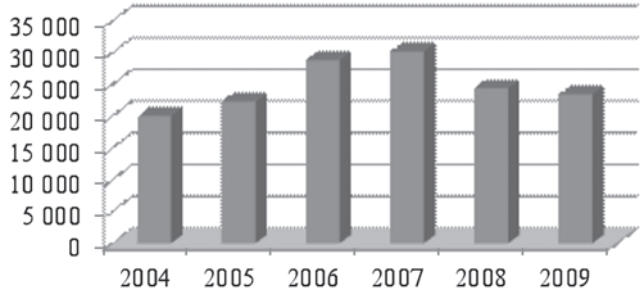

Figure 3. The average income of a family farm (in PLN)

Source: Own calculations based on FADN data.

The constant upward trend in the income of agricultural producers, observed in the first years of integration, was halted after 2007. In 2008–2009, the average family farm income fell by an average of about 12% per year. This was a result of a visible market downturn, reflected in a slowdown in both production and trade turnover, caused for example by significant growth in production factors. Unfavourable economic phenomena have been accompanied by a constant increase in the level of EU support, which increased in this period by a further 113%. As a result of dynamic growth in the level of EU subsidies, their role in income generation in the agricultural sector has gradually increased. In the first year of accession, subsidies to current operations constituted on average 13% of farm income, while in 2005–2008, this share amounted to 52%, and in 2009 it exceeded 80%.

The study showed strong differences in income levels between the examined groups of farms. There was a strong relationship between family farmers' income and the economic size of a farm, as well as the direction of production (type of farming). The value of family farm income increased alongside the economic size which resulted mainly from the properties of the support system (subsidies paid to UAA), as well as from the diverse manufacturing capabilities (available resources, infrastructure, etc.) between different groups of farms. Throughout the analysed period, the average income on very large farms (over 100 ESU) was nearly 25 times higher than on very small farms and small farms (representing two thirds of the surveyed population). This means that the very large farms, as compared to other groups of farms, experienced significantly greater development opportunities and chances of gaining a lasting competitive advantage.

Nevertheless, in 2007–2009 in relation to the early years of integration, the largest farms were the only ones that reported losses from economic activities. A decline in income (by nearly 28%) was the result of a high rate of growth of production costs, which was almost twice as high as the increase in the value of production. Positive growth occurred in other groups, with the highest (65%) observed in the group of very small farms.

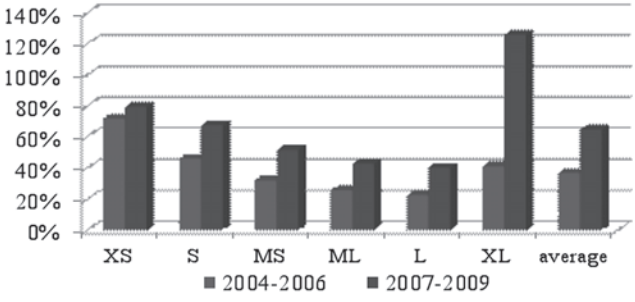

Figure 4. The ratio of subsidies to the family farm according to economic size classes

Source: Own calculations based on FADN data.

In the period analysed, all farms grouped by economic size noted a growth in the share of subsidies to current operations in creating income from the farm (figure 4). This process has proceeded fastest in the largest entities with a large area of agricultural land. The smallest increase was noted in the share of support for family farm income on the smallest farms. In both groups, compared with the other classes of farms, the average ratio of payments to the farm income were the highest. It can therefore be concluded that, in the case of the smallest entities, subsidies were necessary for the maintenance of the farm and farmer's family, and in the case of large entities they were used as a means to cover the cost of production. In other groups of entities, the importance and the share of subsidies in the income of agricultural producers decreased with an increase in economic size. For this group of subjects, external support was only a supplement of income in relation to the production (market) activity.

The research carried out shows that the size of the income of agricultural producers to a large extent was determined by profitability and scale of production, its intensification and the degree of processing, as well as market orientation of the farm. For this reason, in 2004–2009 the highest income was achieved by farmers specialising in granivores breeding and horticulture. Slightly lower revenue was achieved by dairy farms and farms specialising in other grazing livestock. The worst economic situation was registered in farms with mixed production profile which constitute more than half of the surveyed population. Low profitability of this type of production (including a low ratio of price to the unit cost, e.g. of cereals) and low levels of processing meant that it was the only group of entities obtaining income below the average of the FADN field of observation.

In the dynamic approach, in the comparable periods the revenue growth was observed in the majority of farm groups

divided according to types of farming, with the highest rate of growth (20–30%) characteristic of farms specialising in field crops and milk production. The main driver for the significant improvement in the income situation in the two groups of subjects was the large increase in production growth determined by increase in demand and prices of commodities produced. In mixed farms and grazing animals-oriented farms the value of family farm income increased on average by 7–12% per year. In turn, the income situation of farmers with permanent crops has deteriorated (by ca. 10%).

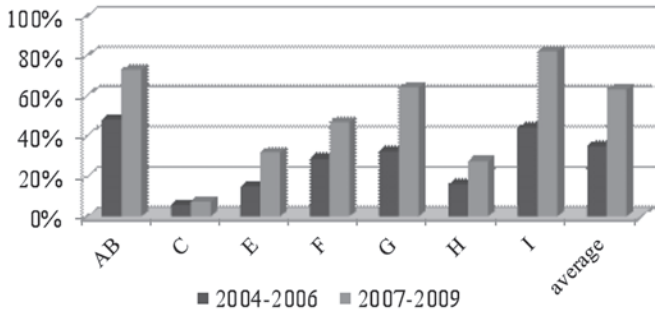

Figure 5. The ratio of subsidies to the family farm according to types of farming

Source: Own calculations based on FADN data.

The analysis reveals that the non-market support was the most important for farms with production based mainly on land resources for which complementary payments were given (figure 5). This phenomenon was most evident on farms with mixed production, where in the period of 2007–2009 total subsidies accounted for 82% of income, compared to 44% immediately after the accession. High rates of subsidies compared to production-generated income were also reported on farms specialising in field crops and other grazing livestock. These farms, despite the large area of agricultural land, were characterised by low profitability and weak links with the market. However, to a much lesser extent, the payments determined the level of income from horticultural farms, as well as those focused on livestock production, mainly breeding granivores. These entities were able to obtain a much higher income, for example due to more efficient and intensive production and the higher market competitiveness of An unequal apportionment of direct support between farms and the different scale of its impacts on the economic situation of the family farm ware also confirmed by the results of the surveys. Among the surveyed farms, nearly 95% received direct support. In the studied population, the average value of direct payments (which constitute the most important form of support) per farm was PLN 8,843. A quarter of farms obtained payments not exceeding PLN 2.5 thousand (lower quartile), and a quarter received payments of more than PLN 10.4 thousand (upper quartile), whereas for half of the respondents support was less than PLN 5 thousand. The asymmetry factor was positive, which indicates a positive skewness of the distribution, i.e. the advantage of values smaller than average, and its value indicated a very large variation in this direction. The kurtosis indicator signalled a clear peakness of the distribution. Almost 94% of the surveyed farms that responded belonged to the typical area of characteristic variation, i.e. received payment not exceeding PLN 24.5 thousand (figure 6).

The average area under direct payments was 11.5 ha, giving an average of PLN 714 per ha. As in the case of the amount of these benefits, the distribution of this variable is positively skewed and pointed. Three-quarters of farms received payments for an area not exceeding 13.5 ha, and half of farms for an area up to 7.0 ha. In a typical area of variation (up to 29.4 ha) there were over 91% of the surveyed farms.

Nearly 60% of farmers indicated the great importance of direct support to the farm income, and only 12% a lack thereof. The impact of other instruments such as market intervention, agri-environmental and trade regulations was little or none. The vast majority of respondents (80%) expressed negative opinions about the role of the CAP mechanisms, including direct support, as a factor stabilising income from agricultural activities. However, the proportion of positive ratings on income stabilisation (20%) was more than twice as high as the ratings on markets stabilisation.

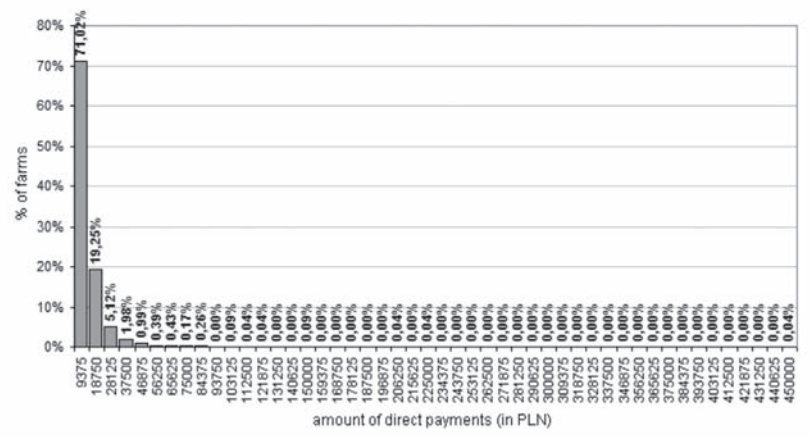

Figure 6. The amount of direct payments in 2010 – interval series histogram*

*Figures shown on the horizontal axis represent the upper limits of the interval series ranges for characteristic (variable).

Source: Own calculation based on Annex 2 of the survey "Family and Farm" IAFE-NRI.

Conclusions

In the early years of integration with the European Union, there was a significant change in the economic situation of Polish agriculture, manifested, for example in the dynamic growth of the income of agricultural producers. The role of the CAP mechanisms in these transformations, in particular the subsidies to current operations, has been undisputed. This was confirmed by both the results of the Polish FADN data analysis and the opinions of farmers themselves. The influence of direct payments is diverse and, to an extent,

contradictory. On the one hand, direct payments boost the farmers' income, stabilise their situation and encourage them to enlarge their farms. On the other hand, they cause agricultural producers to lose interest in improving management efficiency and cost rationalisation. The above factors explain why, despite major changes, the agrarian structure of Polish farms is still fragmented and widely polarised.

Looking at the distribution of support in the agricultural, one should note that it is a very good reflection of the conditions characteristic of Polish agriculture. On the one hand, the majority (almost half) of support goes to a large number of small farms, i.e. the units that are not able to develop in the long-term, regardless of whether they use the support or not. On farms with little economic power and a small area of agricultural land the limited scale of production does not allow for realisation of consumption on the parity level, nor for investment activity. Therefore, this group of farms shows no major change in production. Such farms not adjust production to changing market conditions, or do so to a much lesser degree. Moreover, the increased access to subsidies does not change their weak position in the food chain. This implies that the EU support will never be able to fully offset the effects of small-scale production, or limites efficiency and productivity of production factors (Czubak et al., 2008). This situation raises, at least, some questions about the definition of the objectives of agricultural policy, and the usefulness and effectiveness of support.

At the other extreme, a relatively small number of larger units is receiving very high benefits, but their share in the total sum of support to the sector is relatively small. It is this group of economically strong farms with high production potential, that increasingly determines the market supply of agricultural products and food in the country and in will the future determine the competitiveness of Polish agriculture in international markets.

It can therefore be argued that as a such, due to high agrarian fragmentation of the majority of Polish farms, the CAP only impacts on a small part of our agriculture, at least in terms of improving the income condition of farms, efficiency of agricultural activity and competitiveness of the agricultural sector. Its impact, for the most part, is a distinctly social one. (Judzinska and Łopaciuk, 2012).

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EXPLORING THE VALUE OF BRANDS ON THE MONTENEGRIN BOTTLED SPRING WATER MARKET

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Abstract: The branding strategy is based on future goals relating to clients, aimed at increasing awareness of the brand, creating a positive brand image and establishing a preference for the brand and ensuing brand loyalty. A brand is a very important factor for competitiveness and establishes a leadership position in the market, given the major impact that this form of intellectual property has on the perception of consumers and the success of innovative products on the market. The bottled water market has increased by about 35% in the last five years on the global level, dictated by young consumers who are becoming increasingly aware of the significance of proper nutrition in maintaining health. The research presents qualitative information on the market value of bottled water brands, the general characteristics of retailers, as well as on their target customers. The main task of this paper is to confirm the usefulness of marketing research in modern business as well as to present the benefits of brand value measurement to current or future brand owners.
It is to be hoped that the results presented in this paper may serve as a good basis for upgrading marketing activities, based on a better understanding of target customers and their particular needs, through better communication for the purpose of stronger corporate branding.

Key words: marketing research, brand, brand value, brand value measurement

Introduction

Measuring the brand value is one of the most complex research procedures. The brand value is an important asset and a strategic tool, and it should be managed from a top management position. These features have enabled the development of marketing research so that more sophisticated research on brand value could be performed. Due to this fact, it is necessary to approach marketing research more actively and anticipate the needs of both the consumers and the brand owners. In Montenegro, there are numerous consumers of bottled water. There is a noticeable increase in the sales of non-carbonated water, which is also an existing trend all over the world. The research is focused on observing the retail sale of the products in the consumer spending segment, as well as on proposals for measures for improving sale and brand positioning. The analysis will also include a comparative analysis of the leading brands on the market, brand and company analysis as well as proposals for measures for brand improvement on the basis of the observed situation.

On the local market in Montenegro, water is primarily sold in volumes of 1.5 l and 0.7 l to hotels and restaurants, while individual customers usually buy water in volumes of 0.33l or 0.5l. However, it is noticeable that the market share is 8.8% smaller than in the same period of 2009. Taking into account the seasonal demand for water, volumes of 0.33 l and 0.5 l achieve a higher market share during summer months compared to the rest of the year. During the eight months of 2011, the Montenegrin water factories produced 15,487,093 litres. 1,010,150 litres were exported, representing 6.5% of the total market placement, while 14,548,805 litres were distributed on the domestic market.

The Water Group from Kolasin had the biggest production and best placement on the Montenegrin market in the last eight months of 2011, producing 4,483,430 litres of bottled water, which represents 28.9% of the total water production for this period. After this came the water factory Aqua Bianca from Kolasin which has produced 3,423,945 litres of water during the eight months of this year, which represents 22.1% of total production. All of the water produced by these two water factories was placed on the domestic market.

Materials and methods

In determining the brand value of the Montenegrin bottled spring waters, the method of substitutability developed by Longman and Moran and the Burke Brand index model were taken as a basis. The first method is based on measuring the rate of repeat purchases. Brand equity is higher if the rate is higher and vice versa. The other model for determining brand

equity uses three components: loyalty, brand image and the price value of the brand.

According to their responses consumers are grouped into six categories by being divided into one of two groups each with three segments. The first group consists of hard-core loyals who have previously purchased the studied brand and will wait for the brand to be available in their store or will go to purchase it from another store; shifting loyals who have previously purchased the studied brand, but will accept any other brand as a replacement; and split loyals who have previously purchased the studied brand, but can precisely indicate the brand they would purchase as a replacement. The second group includes potentially accessible customers who have previously purchased a different brand and suggest the studied brand as a replacement; potentially inaccessible consumers who have previously purchased another brand and did not mention the studied brand as a replacement; inaccessible consumers who have previously purchased another brand and will wait for the brand to be available in their store or will go to another store to purchase it.

Results and discussions

Of a total of one hundred respondents, 54% were female and 46% male. The most respondents (51 of them) were between 21 and 39 years of age, then 40 respondents were aged between 39 and 55 years and the remainder were those aged between 15 and 20 (3 respondents) and over 50 (6 respondents). 50 respondents had a university degree while 54 respondents were students or had a high school diploma.

85 respondents were employed, 12 were unemployed and 3 of them were pensioners. The total monthly income of 32 of the respondents was between 300 and 500 euros, and another 31 respondents had a monthly income in the range of 800-1200 euros, while 25 respondents had incomes between 500 and 800 euros, and 12 respondents had incomes over 1200 euros. Most of the respondents (88 in total) live in Podgorica, while the central region has 6 respondents and southern region was represented by 6 respondents.

The largest number of respondents, 24 of them, drink one of the Montenegrin bottled waters several times a day, while 17 respondents drink bottled water once a day, 6 of them drink it two to three times a week, 20 respondents drink it two or three times a month, and the rest of the respondents fall into the category of those who drink it once or less than once a month.

On the basis of the five brands of bottled spring water offered, 50% of the respondents chose Aqua Monta as their favourite brand, thus confirming that this brand is of greatest value to them. Aqua Monta is the bottled water brand with the largest single share (50%) on the Montenegrin market. Aqua Bianca was in second place, chosen by 35% of the respondents, while the third place was occupied by Suza, which is the favourite brand of another 9% of respondents, and at the very bottom, and with the smallest brand equity, are Diva and Gorska, chosen by 3% of each respondents.

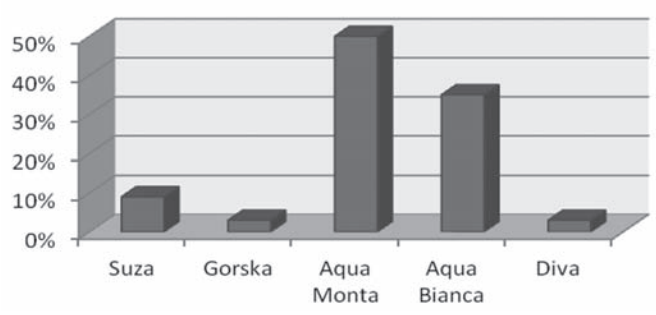

Figure 1: Market share of bottled waters

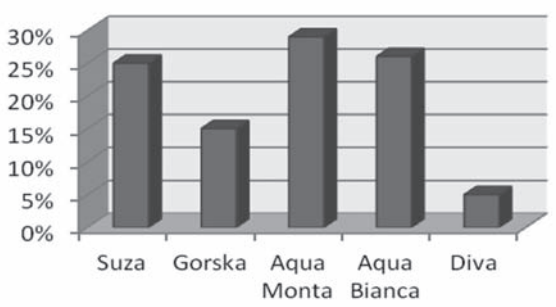

Figure 2: Positioning of brands among consumers

In a situation where respondents have an opportunity to make a choice between three different brands of bottled spring water, their responses will significantly differ from the responses to the previous question, which proves that customers do not show absolute loyalty to the studied brands. The possibility that consumers can make a choice between three brands substantially weakened the value of each individual one, with Aqua Monta being the most trusted brand by 29% of respondents, Aqua Bianca by 26% of respondents while Suza was preferred by 25% respondents. The Gorska water is significantly less favourably positioned in the minds of consumers, with 17%, while Diva is the worst positioned water, with only 3% of consumers having opted for it.

By examining brand loyalty, we have come to the conclusion that according to the responses obtained, customers can be divided into three groups; those who responded that they would either wait for the brand to come into the store where they normally buy their water (1%) or would go to another store to get it (33%) are considered to be the most loyal, while the consumers who would buy another brand when theirs is not available (66% of them) cannot be considered loyal.

The Results Concerning Brand Loyalty

Only 1% of respondents of both sexes said they would wait for their brand, suggesting that there is not a high level of loyalty with regard to bottled spring waters. 46.8% of men and 21.2% of women would go to another store for their brand, which shows that men are more willing to make a greater effort for the preferred brand than women; their loyalty in the analysed segment is much higher, while women in this situation are apparently more driven by convenience. 52.2% of men and 77.8% of women would buy another brand when the preferred one is not available, which confirms the previous

view that men are more loyal to their favourite brands than women.

The respondents were then asked the following question: If you have € 10 to buy water, what is the single amount that you are willing to pay for each of these brands for the same water volume?

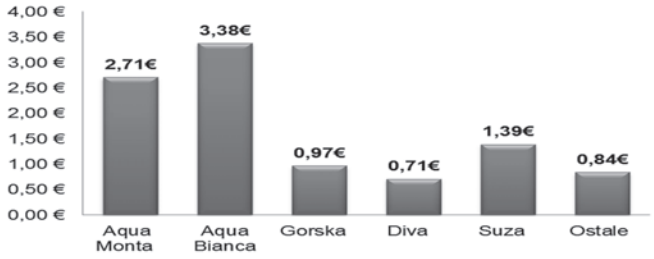

Figure 3: Amounts in euros allocated by brands

Aqua Bianca, at € 3.38, is the brand for which consumers will spend the largest single amount of money, followed by Aqua Monta at € 2.71, and Suza which occupies the third place with € 1.39. For both Gorska and Diva, consumers will spend less than a Euro. It is evident that Aqua Monta and Aqua Bianca enjoy the highest brand equity. For the Montenegrin circumstances, these are two well-established brands with the largest market share. By cross-referencing the responses received to the questions about favourite brands and the significance of certain brand-related elements for consumers, it turned out that the massive scale of purchase was the most important factor for 50% of consumers who prefer "Suza", while the other 50% found the acceptance of the brand by other consumers and the position of the brand in retail outlets the most important factor. For those who prefer "Diva", packaging is most important and they form their views on this water solely on the basis of it. As for the consumers of "Gorska", 100% of those who drink it believe that their choice is primarily influenced by the advertising message of this brand. When it comes to "Aqua Bianca", we see that 14.3% of consumers find the price of the brand crucial for their choice, 31.4% opted for packaging, recalling the advertising campaign accounts for 8.60%, and massive purchase was a choice for 28.60% of respondents, the position on shelves was indicated by 8.60% of the surveyed consumers and finally, 8.50% indicated the bonus package, coupons and discounts offered by the producer. When buying "Aqua Monta", 12% of the surveyed consumers opted for the price as the decisive factor, 42% indicated the packaging, while for 24%, the impact of advertising messages is the most important in the selection of this water, and finally, brand acceptance by other consumers is a decisive factor for 22% of respondents.

Conclusion

Measuring and strengthening the power of the brand is the main objective of marketing efforts for many companies around the world. The analysis of the research results has led to the general conclusion that the available capacities for the production of water in Montenegro are not used to their full potential. Poor, virtually non-existent marketing performance and little active participation in trade fairs, especially in the international market, is the main reason for the poor performance of companies engaged in the bottling of water in Montenegro.

Overall, consumers show the strongest loyalty towards "Aqua Monta" of all brands of water analysed, regarding it as their most preferred brand or the brand which will serve as a replacement in case the preferred brand is not available in the store. This brand has the highest brand equity of all the brands offered in the research, as shown by both qualitative and quantitative indicators. "Gorska" and "Diva" have the weakest position with consumers. Both waters have a relatively small market share, and are either unrecognised or have a poorly built image. Their brand equity is small, which is confirmed by the results of the research. The results obtained through the use of primary and secondary marketing sources can be very important when making marketing decisions regarding the bottled waters analysed.

Brands are now the foundation of wealth for companies and should therefore be properly developed.

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AN INCUBATOR MODEL BASED ON THE TERRITORIAL VALUE CHAIN

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Abstract: Policies to promote and encourage local foods may take many different shapes depending on both the specific targets and strategies. Some policies, especially at a local level, promote supply-chain vertical and horizontal integration as a comprehensive strategy which aims to help firms pursue several of the promoting policies. A business model that focuses its attention on the consumer of the product and territory can be a crucial driver in generating a 'land fecundation' as a response to globalization. The aim of the paper is to investigate the link between rural development and territorialisation, exploring the role of Local Action Groups Integrated Projects of Food Chain and Rural Development Programmes from 2007-2013 in a region in Southern Italy. The article makes use of a value chain approach, starting with Porter's value chain model and five forces model of competition; it proposes a methodological framework for the development of an organisational model that includes and builds networks between the several stakeholders and local programmes, creating a shared strategy to revitalising the area and the food choices of its residents. This revitalising process takes place through the implementation of a multi-purpose incubator establishing strong partnerships that are able to foster complementarities among all rural stakeholders. Conclusions and implications for policy makers are drawn: a model of territorial organisation could link territorial capital and local stakeholders, and therefore the programming carried out under the entire RDP.

Key words: rural development, territorial capital, incubator

Literature review

Some policies may foster community-supported agriculture, while others focus on the influence of food processors and retailers on food chain, market-certification of location, direct-to-consumer marketing channels, information policies; others are eager to emphasise the efficiency of the production functions of local food systems.

The definition of possible growth strategies for each territory must necessarily rely on local resources and on their 'territorial capital' (Camagni and Capello 2008; Melachroinos and Spence 2013; Perucca 2013) and social capital (Lin 2001; Lippert and Spagnolo 2006). The term 'territorial capital' was proposed for the first time in the context of regional policy by the OECD (2001), which has developed a structured list of factors acting as determinants of territorial capital and material goods ranging from traditional to newer assets. These factors may include the geographic location, traditions, natural resources, quality of life or agglomeration economies, but may also include incubators or other business networks that reduce transaction costs. Other factors may be 'non-commercial interdependencies, such as local knowledge, customs and informal rules that enable economic actors to work together in conditions of uncertainty, solidarity, mutual assistance and co-operation of the ideas (OECD 2001). According to Marshall, there is an intangible factor called the 'environment', the result of a combination of institutions, rules, practices, producers, researchers and policy makers that allow a certain degree of creativity and innovation (OECD, 1998). In addition, the EU Commission said that regional development policies should help areas to develop their specific territorial capital as soon as possible (European Commission, 2010). The concept of territorial capital has made its appearance outside of a strictly scientific field. The theoretical literature of endogenous development has long drawn the attention of scholars on regional intangible assets such as atmosphere, synergy and

management of local factors. Such elememts over the last decade have been interpreted in the form of share capital (Colemann 1990; Putnam 2003), relational capital (Camagni and Capello 2002) or, in a slightly different context, as a wealth of knowledge (Foray, 2000; Storper, 2003), human capital (Capitanio *et al.* 2010; Galindo-Pérez-de-Azpillaga *et al.*2013*;* Paci and Marrocu 2013; Servillo *et al.* 2012). The role assigned to the territory changed from being considered as a source of environmental tools for the development of enterprises to being seen for the role it has in the process of the construction of knowledge, cooperation models and decision-making. The territory then becomes a complex of socio-economic relations that form the relational capital or social capital (Putnam, 2003), an area which is bound geographically, and 'a system of local governance', which combines a community, a group of private actors and a system of local public administration (Camagni and Capello, 2002). Scott (2001) states that globalisation is not a situation of 'data' in the world, but rather a process in motion, generated by the opening of markets, new trends to locate businesses, technologies and information. Thus, there is an essential relationship between social capital and the natural capital of a territory. It would be a mistake to dwell closely on resources, but it is useful to consider the ability of the individual to preserve the environment, utilising it in a sustainable way (Perman, 1996). This approach to territorial capital is based specifically on the theory of milieu innovateur, a result of innovative processes, synergies, relationships, human aspects, resources, knowledge and local development (Camagni 1995; UNDP 1990; 1997). The elements that constitute the '*milieu innovater'* can be summarised in close geographic and sociocultural proximity; the relational component of the territorial capital is composed of cooperation, trust, cohesion and sense of belonging (Lin, 2001) Therefore, the value that is obtained by combining capital, relational capital, cohesion and cooperation among the actors of local development, is the added value of both territorial development and territorial capital.

Rural development and territorialisation

The concept and experiences of rural development, based on the attempt to increase the competitiveness of the agricultural sector and stimulate the development and enhancement of a territory are key themes in the European Union and constitute a major part of alternative forms of endogenous development that have tested in the last twenty years. Within the Structural Funds reform and the adoption of the objective of social, economic and territorial cohesion, the European Commission has identified the concepts of partnership and programming as central in new policy for local development, based on the formation of partnerships made up of local, economic, social and institutional stakeholders. The Integrated Projects of Food Chains (IPFs) represent a set of coordinated and organic operations related to several measures of the Rural Development Programme (RDP); an aggregation of individuals operating in different segments of a given food supply chain accessing the RDP through the presentation of an application proposed by an individual leader. The initiative should therefore provide for a plurality of participants linked by constraints of contractual nature that highlight the obligations and mutual responsibilities in the accomplishment of the whole project, in order to fulfill certain goals. The implementation of IPFs can make a decisive contribution to the improvement of competitiveness of important Italian agro-food sectors. The range of the IPFs includes the agriculture, forestry and agro-industrial sectors to be geographically localised in the entire region. The regional call aims at promoting and reinforcing the integrated approach and the aggregation and cooperation among the different parties of the chain (from production to marketing), in order to promote and strengthen the partnership praxis, to increase the value of the sector and the competitiveness of the enterprises involved, and to promote the typical products of the territory, thus helping to create social capital (Contò *et al.* 2011). The focus on multiple subjects of programming (economic and social partners and any other appropriate social organism), identified on the basis of the criteria of complementarities and partnerships, became the key component. Within EU Leader + pursuant to art. 62-61 of EC Regulation No. 1698/2005, a partnered local development approach shall be implemented by Local Action Groups (LAGs); the Leader approach is characterised especially by the concept of multi-sector strategy, based on the interaction between parties and projects of different sectors of the local economy and on the implementation of innovative approaches, projects cooperation, and networking of local partnerships. The LAGs, therefore, are the main parties of a bottom-up planning process which has the task of working out the development strategy and is composed of both private and public partners, thus gathering a balanced and representative set of the different socio-economic local stakeholders. Each LAG is, in short, a programming tool representing the various socio-economic sectors and bringing together all potential public and private parties of the development process in order to define a planned policy (Contò *et al.*, 2012a and 2012b).

The territorial social capital and the analysis of stakeholders: the case of Apulia Region

The principle of "territorialisation" dictated by the EU for the implementation of the RDP 2007-2013 in Apulia has generated, over recent years, a programmatic fragmentation with reference only to the agri-food sector and rural areas. In 2009, the Apulia Regional Government has recognised 25 LAGs whose actions involve almost entirely, at least for inland areas, the regional territory. Apulia is a region where the Italian agro-food sector is prosperous. In 2011, Apulia approved and funded 42 out of the 64 projects which were submitted. The highest number of IPFs was registered in the Horticultural chains with 12 projects approved; 7 projects for the Cereal and the Wine supply chain; 6 for the Dairy chain; 4 for the Olive oil chain; 5 projects for the Livestock supply chain; and just one project for the Forestry supply chain. A programmatic fragmentation of the

local development strategies clearly emerge, relentlessly opposed to the need for a harmonious development of the regional economy. Therefore, with regard to rural development, it is crucial to achieve a unique organisational model, so as to harmonize local planning and to compete within the globalised markets that dominate the food system. The principle of territorialisation of regional interventions can represent a relevant opportunity for the implementation of development strategies and can pave the way for transnational and interregional programs, which are essential in fostering the development of relationships and networks. In order to plan a harmonious development of the regional economy starting from the local specificities, it is crucial to define a synergistic model of the territorial organisation of rural development in which the LAGs and the IFPs are called to work according to the logic of integration and overcoming the territorial boundaries, in favour of the development of production chains and territories. Social capital is not only a set of norms and informal rules, but also of networks that enable cooperation, trust, and collective action for the common good. Social capital does not arise in an instant. It is a product of social (multi-agent) interaction (Yiheyis et al. 2007). Therefore, these social capital variables could act as important predicting factors in determining the adoption and utilisation of RDPs programs (Firouzjaie et al. 2007) in an efficient way. As can be seen in Table 1, both the IPFs and the LAGs involve local stakeholders and represent the legal instruments capable of aggregation at the local level, but are especially useful in defining and developing the social capital of a given geographical area or production system. Hence, the need arises to define an organisational model at the local level, connecting all the programming of the RDP and networking territorial capital.

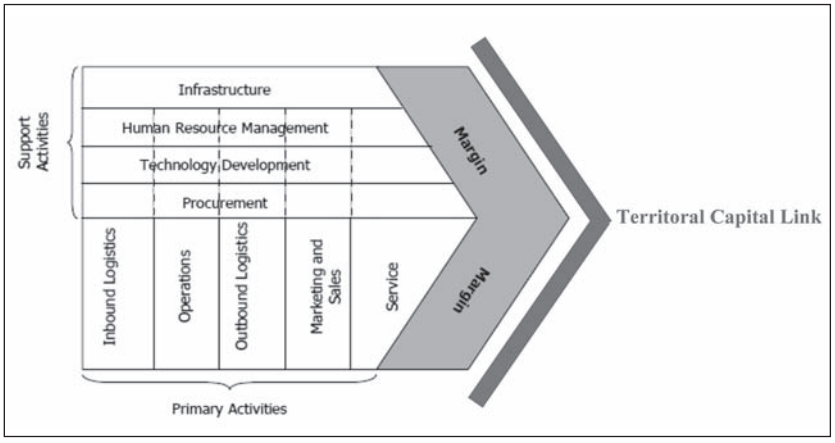

Figure 1. Porter's value chain template. Source: own processing based on Porter's (1985) model

Table 1. Social capital in LAGs and IPFs. Source: own processing

Stakeholders	LAGs	IPFs	Stakeholders	LAGs	IPFs
Municipalities and Province	x		Consortia	x	x
Public Bodies	x	x	Associations	x	x
Firms	x	x	Universities	x	x
Cultural associations	x		Banks	x	x
Primary Cooperatives	x	x	Training centers	x	x
No-profit Cooperatives	x		Others	x	x

Here we refer to Porter's models, inserting further territorial capital implications. Value chain analysis (Porter 1985) describes the actions within and around an organisation, and relates them to an analysis of the competitive strength of the organisation. Thus, value chain analysis evaluates the value that each particular activity adds to the organisation's products or services. Porter's scheme highlights that an organisation is more than a casual collection of machines, equipment, people and money that produce something for which customers are willing to pay a price only if an arrangement into systems exists: performing particular activities and managing the linkages between several activities are a source of competitive advantage. In order to consolidate and entrench this competitive advantage, territorial capital can be a crucial tool for generating a 'land fecundation' as a response to global competition (Fig. 1). In this new template, "Margin" implies that organisations realise a profit margin not only caused by their ability to manage the linkages between all activities in the value chain, but also due to territorial capital that reduces uncertainty in decision-making and innovation processes and facilitates collective action via ex-ante coordination. In other words, the strong link to territory and thus to its capital/needs enables an organisation to deliver a product/service for which the customer is willing to pay more than the sum of the costs of all activities in the value chain.

In Porter's (1979) competitive model too, there are two strategic objectives: creating effective links with customers and suppliers and creating barriers to new entrants and substitute products. The creation of a substrate linked to the territorial/institutional capital is added (Fig. 2) and is crucial in order to reach the first two objectives. Awareness of linked territory adjunctive competitive forces can help a company stake out a position in its industry that is less vulnerable to attack (Porter, 1979).

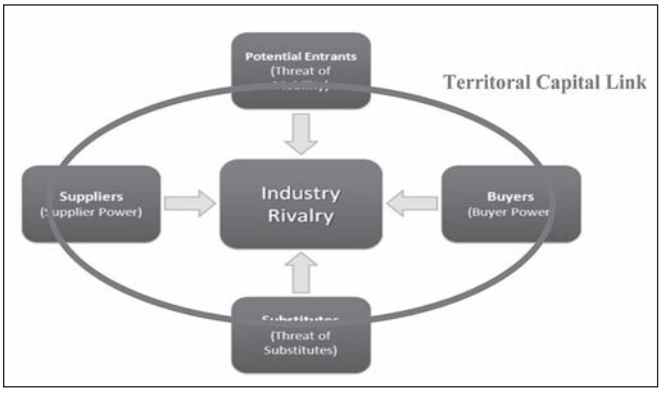

Figure 2. Porter's Five Forces Model. Source: Own processing based on Porter's (1979) model

An organisational model for the development of rural areas: the multi-purpose incubator

In order to increase the competitive advantage of the area, it is essential to promote regional development models capable of organising integrated participation of stakeholders in strategic decision-making. According to this logic, we implement an incubator model of territorial capital (Irianto, 2011). It is an organisational model conceived as physical and telematic space, useful in promoting the establishment and development of the territorial capital of a rural area able to directly involve local stakeholders; the latter are the protagonists of implementation processes of the RDP about processes of rural governance and consultation of programming choices for the period 2014-2020. It is therefore a model of agency for rural development, combining the operational objectives of the IPFs and LAGs operating in a specific regional area and generating local value – and thus competitive advantage of the region - from a combination of decisions and the related activities of local stakeholders. The incubator capital creates connections between economic, social and cultural rights and promotes joint stake actions using the entrepreneurial drive as a lever for innovation and regional development. The incubator can be depicted as a multi-purpose centre where the following laboratories are: Services, Demonstration, Communication, and Documentary, Education and Training.

The *Services Laboratory* is functional to organisation service activities, payable either door to door and via the web, such as technical advice to businesses, information sessions and transfer of specific know-how. The Laboratory is designed as a control room of predominantly technical management processes, which help to strengthen companies, and provide solutions and continuous improvement processes. The main activities are related to:

- **Operative management room** of supply chains to cope with all the chain limitations and operational management. The establishment of support services will be a crucial driver for growth of companies and of territory. The interaction should favour the supplier-customer relationships between leading companies and the transformation of the territory, the use of ancillary services and the adoption of common standards for efficiency and economy to confer the management of companies, for more help to characterise the land and its productive vocation. These procedures will be used to define the functional specification of a software platform that supports a processing point of view, the operation and management of the supply chains themselves, introducing tools for e-consulting, solutions for traceability throughout the supply chain and an electronic logbook .
- **The evaluation and certification of quality products** supports pathways to improve the quality of production, to be pursued through reengineering processes, and promotes the aggregation of local producers and routes to raising the level of product quality through the achievement and maintenance of voluntary certification, based on specifications approved by third parties and registered trademarks that correlate productions and territory of origin. The laboratory is a place of synthesis between technology and tradition, using the former to read, interpret and transfer the latter, favouring innovation in processes and production systems.
- **Coordination for the management and expansion of educational and multi-functional farms** for networking activities developed by the Leader, funded by the LAGs. In this context, the Laboratory services will be responsible for activities which train those involved in running farms to become multifunctional farms and for involvement of other interested parties in various ways, such as universities and public and/or private research centres. Furthermore, it will promote and animate a network of multifunctional farms in the area in order to facilitate the exchange of experiences.
- **Station for the dissemination of innovative methods and techniques for the treatment of waste in agriculture and the use of alternative energy sources**: for testing environment and agro-energy solutions on a pilot scale, providing guidance technologies to solve and reduce environmental impact and to integrate farm incomes. Hence the need to establish the effective raising of awareness aimed at both operators and public authorities having jurisdiction in this area, and also in order to foster a connection between the various stakeholders including companies, public administrations and public research organisations and/or individuals.

The fundamental goal of the *Demonstration Laboratory* is commercial and promotional in terms of agricultural food production, craft, cultural and environmental tourism pursued through the direct involvement of companies producing and processing the catering industry, sommelier, and so on. The main activities are: marketing strategies and specific marketing channels, especially in conjunction with cultural events and holidays; permanent exhibition and sale of food, crafts and cultural tourism; area for wine tasting and space in which temporary pilot models of technological solutions can be proposed to the territory, regarding issues related to the treatment of waste, the generation of energy from renewable alternatives, and providing the opportunity for farmers to benefit from audio and video multimedia.

The *Laboratory of Communication*, together with the activities of the *Demonstration Laboratory* must plan and implement activities such as drafting editorial productions of traditional and multimedia tools related to the activities of the supply chain and the region and territorial portal web management.

The *Documentary, Training and Educational Laboratory,* finally, has the function of carrying out training, optical storage and document scanning for businesses. In particular, coordinating the activities of various stakeholders already involved in local activities developed within the IPFs and LAGs, the laboratory should address the following areas: Dietary education and nutritional quality; Training new skills; Paths of development and enhancement of integrated land resources; Innovation and knowledge transfer. This last aspect, developed in partnership between the production system and the research

system, becomes a driving force for the growth of social capital and the diffusion of knowledge.

Conclusions

The present research work intended to define a prototype model of the organisation of local rural development, based on theories of territorial capital, and on the ability of an area as a whole to acquire a competitive advantage, as the result of the interactions of the various stakeholders involved in the programming tools. Our analysis, carried out in a region in Southern Italy, has clarified that both the IPFs and LAGs often involve the same stakeholders in defining strategies of territorialisation of the interventions provided by the RDP. For this reason, the organisation of these stakeholders' participation in the processes of defining the decisions and their implementation at the local level allows the territory to do the following: optimize the processes of developing the competitiveness of the multifunctionality of regional and local in-progress agriculture; generate effective processes of land management and plan measures prior to the 2014-2020 programming period; and strengthen the territorial capital. Finally, this paper defined an incubator model, adapting Porter's value chain model and five forces model of competition by inserting territorial capital implications. The strong link to territory and thus to its capital/needs enables an organisation to deliver a product/service for which the customer is willing to pay more than the sum of the costs of all activities in the value chain. In this context, therefore, a prototype model of territorial organisation has been defined, capable of networking and linking territorial capital and local stakeholders and, therefore, the programming carried out under the entire RDP. Configured as above, the incubator model could have the ability to generate and drive the processes of local development through the strengthening of the capital of the territory.

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THE IMPACT OF THE "GREENING" OF THE COMMON AGRICULTURAL POLICY ON THE FINANCIAL SITUATION OF POLISH FARMS

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Abstract: This paper presents an assessment of the impacts of introducing the greening scenario of the CAP, proposed by the European Commission as an alternative for the reformed CAP after 2013.
In the past, the CAP has undergone numerous transformations in response to the changing macroeconomic environment and in reaction to developments in the farming sectors in EU countries. On the 12th of October 2011, the Commission presented a set of legal proposals designed to make the CAP a more effective policy to encourage more competitive and sustainable agriculture and vibrant rural areas. The proposal brings various new elements under consideration, some of them raising strong controversies such as introducing "greening" as a component of direct payments. Changes in the direct payments scheme in line with the EC proposition include forcing adjustments in the cropping pattern and creating ecological focus areas (EFA) on 7% of the farm land ; the consequences of such a proposal on the size and structure of agricultural production, and thus on the economic performance of farms and the whole agricultural sector are uncertain.
The authors analyse historical changes to the CAP with a focus on a growing importance of the environmental component of the CAP, discuss different scenarios of shaping the direct payments system and present the results of modelling the impacts of greening the CAP on the Polish farming sector with the use of the LP optimisation model. The study was based on Polish FADN data.
Results show that the majority of farmers in Poland comply with the crop diversification constraint of greening. However, establishing the required EFAs and necessary diversification on farms with simplified cropping structures will have a negative impact on the volume of agricultural production as well as on farm incomes.

Key words: CAP, greening, ecological focus area, crop diversification, farm income

Introduction

Proposals for the reform of the European Union's Common Agricultural Policy (CAP) for the budgeting period of 2014-2020 are still being discussed and analysed regarding the potential effects of these reforms. The basic document defining the shape of the future CAP is the proposal of the European Commission (COM 2011/625), although a significant voice in the discussion was represented by the European Parliament, as well as by the individual Member States. One of the essential elements of the reform is the concept of *greening* the CAP. This raises numerous controversies arising from the ambiguously defined objectives of *greening* as well as because of the difficulty in estimating its effects.

The implementation of the requirements of a CAP which has been greened will above all enforce the adjustment of crop structure in agricultural holdings, as well as the designation of a suitable ecological focus area. This will affect the area and structure of agricultural production, with changes in agricultural income thus arising.

The potential impact of the 2013 CAP reforms on various environmental and economic aspects, taking into account the European Commission's proposals of November 2010, has been discussed in a number of publications (Helming and Terluin, 2011; Van Zeijts *et al,* 2011). In addition to examining the impact of changes in the CAP on biodiversity and reducing greenhouse gas emissions, these authors also attempted to estimate the cost of greening and the impact on the development of agricultural income in the EU using the CAPRI model. The analysis shows that the inclusion of the requirements on greening to the direct payments system will improve income in regions with extensive agricultural production, such as those with the grazing system, but will worsen the results in regions with intensive agricultural production. The authors conclude that the reform's impact will be to improve agricultural income in the new Member States, while it will remain unchanged in the EU-15. However, one should refer to that conclusion with some caution, because due to its nature, the sectoral CAPRI model does not directly reflect the processes carried out on individual farms. This doubt is confirmed in analyses done by DG AGRI (EC, 2011), cited by A. Matthews

who states that "implementation of the instruments related to green payment will affect the increase in management costs in the EU or in the short-term the decrease in agricultural income". It is estimated that the cost of greening can reach 33 EUR/ha in 2020. One consequence of the exclusion of the use of arable land intended as an ecological focus area will be a reduction in supply and therefore an increase in the market prices of crops. The European Commission estimates that the increase in prices would apply to wheat and sugar beet (both seeing an increase of 3%), barley (12%) and beef. It is estimated, however, that the increase in prices and the expected increase in yields will not fully compensate for higher production costs, which will result in an average drop in agricultural income by 2% (Matthews, 2011).

The authors of another publication (Westhoek *et al,* 2012) analysed the impact of the greening of the CAP on the environment and concluded that introducing the obligation to diversify crop structure will not have a significant impact on improving the quality of the natural environment, since according to the estimates, the need to comply with this requirement applies only to 2% of the agricultural area in the EU.

More in-depth analysis of the effects that greening the CAP would have on production and agricultural income in Poland was carried out as one of the tasks of the research programme "Direct payments and budget subsidies versus finance and functioning of holdings and agricultural enterprises", realised by the Institute of Agricultural and Food Economics. The methodology of the analysis was developed and preliminary estimates of the effects of greening were made for selected types of cereal farms in the first stage of the implementation of the tasks. One finding was that in the population of farms in the Polish FADN which were the subject of the analysis, the degree of adaptation to the requirements of greening is diverse, and the effects are therefore unevenly spread between different groups of farms. In cereal farms adjusted to diversification of crops, in which it is necessary to isolate an ecological focus area, the reduction in agricultural income does not exceed 4%. However, in farms with a highly simplified structure of crops (mainly monocultures) and the lack of an ecological focus area consistent with the requirement of greening, the reduction in income can be as high as 20% in case of monocultures on good soils. Increased adjustment in crop diversification causes a decrease in the impact of the CAP reform on the development of the income of particular groups of farms. The preliminary analysis of only one type of FADN farm shows that in Poland, the required separation of ecological focus area will have a greater impact by far on agricultural income than will the obligation of diversification (Czekaj *et al,* 2011).

This paper presents an estimation of the effects of greening the CAP on different types of farms, up-scaled further to the entire population of FADN farms. The results of the analysis pertain to the first year (2014) of the new EU budget perspective. In this research we used a linear static farm optimisation model FARM-OPTY using MS Excel and SOLVER. Farm models were developed for specific types of farms using FADN typology with the use of three agricultural policy scenarios.

Methodology

Analyses of the effects of greening the CAP were made for a specific variant referred to in the European Commission's proposal as "**integration scenario**", which includes the concept of "greening"[1]. The basic requirements for greening included in the optimisation model are:

a) minimum of 3 crops in rotation, with maximum proportion of one of them at the level of 70% and a minimum proportion in the crop structure at the level of 5%;

b) maintaining the existing areas of permanent grassland, with the right to reduce the area by no more than 5% compared to the base year;

c) allocation of 7% of arable land as an ecological focus area, including ecological land such as land left fallow, terraces, landscape features, buffer strips and afforested areas.

According to the initial assumption and guided by the European Commission's proposal for the purpose of modelling, five agricultural policy scenarios were constructed:

Base Scenario [Base_2009] and Baseline_2014 scenario

These scenarios assume a continuation of the current CAP. The base scenario is used only to calibrate models constructed on the basis of FADN data as of 2009. The baseline scenario provides a benchmark for other scenarios of the reformed CAP. The baseline scenario assumes no change to the existing mechanisms of the CAP, assuming that the model will apply direct payment at the level which applied to Poland in 2013.

B. Integration Scenarios, including the concept of greening the CAP as proposed by the European Commission. This scenario highlights three options:

B1. basic variant of greening [**GREEN_2014**], in which, in the absence of a clear definition of the term "crop" in the European Commission's proposal, it was assumed that the crop is a single plant (species) – e.g. wheat, rye, rape, corn, etc.

B2. simplified variant of greening **[GREEN_ZB 2014]**, in which the term "crop" is understood as cereals in general, forming a group of crops.

B3. variant of the resignation from 30% of payment for greening **[GREEN (–30%) _2014]**, which allows for the possibility of not meeting the conditions of greening and reducing direct payments by 30%.

The main data sources were Polish FADN resources. Data from 2009 were used to develop a concept of typology and parameters for farm models. The data comes from 12,258 research facilities (individual farms). The entire population was divided into production types, adopting the criteria consist-

[1]Preliminary methodological assumptions presented in the study [Czekaj, Majewski, Wąs 2011] have been reviewed and modified for the purposes of this study.

ent with the Community typology for agricultural holdings of 2009 (Goraj *et al,* 2011). According to the adopted methodology, the standard output (SO) was used to determine the economic size and type of production, which is defined as "the average value of production of five years in specified plant and animal production obtained from 1 ha or 1 animal within 1 year in average production conditions for the region".

Types of model farms

The process of selecting the types of farms for modelling consisted of four basic steps and proceeded according to the following scheme:

- Step 1 – Division of farms by type of production, according to the Community typology for agricultural holdings of 2009;
- Step 2 – Further division of farm groups based on the degree of adaptation to the "greening" requirements:
  - **"green"**, here, means that farms meet one or both of the two requirements of greening – diversification of crops and ecological area (7% of arable land);
  - **"non-green"** means farms that do not meet the criteria for greening, neither in terms of diversification of crops nor minimum fallow land on the farm.

Among the **"green"** farms, the following were distinguished:

- farms that meet the requirement of diversification and ecological area in all of the greening scenarios [designated as D < 70%+E],
- farms that meet the requirement of diversification and ecological area except for the GREEN_ZB scenario. This group will include farms with more than 70% of cereals in the crop (D > 70%+E),
- farms that meet the requirement of diversification in accordance with all the greening scenarios analysed [D < 70%],
- farms that meet the requirement of diversification except for the GREEN_ZB scenario, i.e. the group includes farms with more than 70% of cereals in the crop [D > 70%].

"Non-green" farms were divided into three subgroups:

- farms with cultivation of plants in monoculture,
- farms with two equivalent crops (proportion of approximately 50% each),
- farms with a dominant crop (marked as MAIN+).

The result obtained after completion of the second phase is to determine the structure of farms with regard to the degree of fulfilment of the "greening" conditions in the various production types according to nT14 in the FADN sample (Table 1). 90% of the farms in FADN meet the conditions for recognising them as "green" based on the criterion of crop diversification. However, only 11% of farms are fully adjusted and meet the two essential criteria. From the above, it follows that the introduction of the requirement to diversify crops will not require significant adjustments to the structure of crop production (apart from the relatively small percentage of farms with strongly simplified crop structures). Stronger changes in the production and financial situation may be brought about by the increase in ecological area to the level of 7%.

Table 1. Structure of farms according to production types in the FADN sample with regard to fulfilment of the greening criteria. Source: Own study.

Description	Cereal	Arable	Cattle	Pig	Mixed	Other	Total
D+E	5%	9%	6%	3%	5%	60%	11%
D	71%	82%	86%	84%	89%	28%	79%
MAIN+	9%	5%	4%	4%	3%	6%	4%
TWO CROPS 50/50	12%	2%	3%	8%	3%	3%	4%
MONO-CULTURES	3%	2%	1%	1%	0%	4%	2%

- Step 3 – Division of farms by economic size. For ranges of economic size expressed in standard output (SO) there are four classes of farms, of which three: small (4,000 € ≥ SO ≤ 15,000 €), medium (15,000 € ≥ SO ≤ 50,000 €) and large (SO ≥ 50,000 €) will be the subject of modelling.
- Step 4 – Selection of farms with similar crop structure. This step applied only to farms which were not adjusted for diversification of crops. As a result of the analysis of the crop structure, we defined 448 types of farms selected on the basis of the criteria of belonging to the production type, adjustment to the proposed requirements of the new CAP, economic size and the dominant crop in the crop structure.

The farms were also assigned a word describing the soil quality determined by the average index of soil quality[1].

In all types of farms, an average value of parameters was specified and included in the optimisation model, covering the area of permanent grassland and ecological focus area, one of the two basic requirements of greening. The estimated size of the ecological focus area includes land left fallow.

In the development of parameters for models based on FADN data, it outliers (abnormally high or low) were found, especially in relation to variables such as marginal productivity, product prices, or some financial data from farms. The values of the characteristic appearing out of permissible range were replaced respectively by the maximum allowable value of the characteristic for values above the permissible maximum or by the minimum acceptable value for values less than the acceptable minimum. The above procedure was applied to crops, prices, productivity of animals, production values of residual crops (not subject to optimisation) per 1 ha, and the values of animal production not subject to optimisation per 1 LU (Czekaj *et al* 2012).

[1]The soil quality indicator is calculated by dividing the conversion area by the agricultural land area, expressed as physical hectares of the analysed farm.

FARM-OPTY agricultural farm model[1]

For each farm type, the optimisation model was solved with the use of the analysed agricultural policy scenarios, and the average change in income resulting from the introduction of appropriate greening scenarios was calculated.

The structure of the model used in the calculations allows for optimisation of the structure of crops and livestock production, reflecting the specific conditions of the different types of farms in order to maximise agricultural income. The objective function is:

$$\underset{x_i \geq 0}{DR} = \mathbf{p}^T(\mathbf{x} \bullet \mathbf{y}) + \mathbf{s}^T\mathbf{x} + fs - \mathbf{c}^T\mathbf{T}\mathbf{x} - fc$$

provided that Ax ≤ B, where:
DR – agricultural income (numerical value of objective function); p – vector of prices (n x 1); y – vector of yields and productivity (n x 1); x – non-negative vector of optimum levels of production activities (n x 1); x•y – Hanamard product; s – vector of payments for production activities (n x 1), c – vector of input prices (z x 1); T – matrix for input consumption for individual activities (z x n); fc – value of relatively fixed costs; fs – value of operational subsidies relatively independent of the level of production; A – resource utilisation coefficient matrix (m x n); B – vector of available resources (m x 1).

In the process of optimisation, the model enables us to determine the production structure based on the parameters entered for 23 crop production activities, complemented by non-productive activities (set aside, green manure in main crop, ecological infrastructure) dependent on a scenario and basic activities in animal production. When determining the boundary conditions of the model, we assumed that the set of crops found in the base models will not be expanded with potentially high-yield activities (such as potatoes, sugar beet, vegetables, fruit, etc.), considering that the increase in acreage of these crops in the whole sector is limited by existing demand, technological barriers and skills at the level of a farm. In the greening variant of GREEN (-30%)_2014, with a reduced area of cereals, we admitted the possibility of introducing or increasing the share of plants similar to cereals – rapeseed and legumes for grain.

Model solutions were prepared for 2014, the first year of the new budget perspective and the reformed CAP. This allowed us to disregard long-term trends in prices and marginal productivities in our considerations – we accepted the assumption that in the short term these parameters will not change significantly in relation to the current state.

Results of model solutions

Farms with an economic size over 3 SO, representing the most numerous production types of farms in Poland, were selected for modelling from a total of 448 separate types of farms. The following group of farms were treated as residual: farms from economic class 1-2 SO and orchard farms, which, due to their small area or specific activities, are exempt from the obligation of greening, as well as others, e.g. poultry farms and other using nutritive fodder, the number of which is small in both the FADN sample and the general population of farms in Poland.

From the types created for modelling, 338 were selected. Separate modelling types of farms were created on the basis of 10,966 farms from the FADN sample and represent 654,960 individual farms. The remaining 110 types of farms classified under the group of residual farms were created on the basis of data from 1292 FADN farms representing 95,586 real farms in Poland.

The results from the model, presented below (for 338 types of farms), are aggregated based on the weights constructed on the basis of the proportion of each model type represented by farms in the FADN sample. Whilst the effects of the implementation of assumed changes in the CAP can be considered as having been objectively estimated for farms from the FADN sample, the generalisation of the results to the level of farm population represented by analysed farms from the FADN sample using the variable SYS 02 is approximate.

Of the entire sample of model farms, approximately 5% meet the basic requirements of greening (the share of ecological focus area at 7% and diversification of cropping patterns). Nearly 85% of farms have sufficiently diversified structure (these farms must allocate a sufficient area of their arable land to create an ecological area) and other farms do not meet either of these conditions. The highest percentage of farms that fully or partially meet the requirements of greening is on cattle and mixed farms, which is due to some extent to their dominant share in the total population of farms (over 60% of the analysed population). However, the main factor contributing to the diversification of crops is the need for fodder crops on arable land, supplementing, in relation to permanent grassland, the demand for forage for cattle.

Nearly 10% of the model farms are characterised by a highly simplified structure of crops (including just over 1% of farms with crops in monoculture); these farms would have to introduce additional crops to achieve the greening conditions, while reducing the scale of the plants currently grown on these farms.

The density and structure of livestock corresponds to the types of cattle and pig farms. On mixed farms, the predominant livestock are pigs. A small population of livestock, with the majority of pigs, is also found on cereal and arable farms.

Table 2 shows the modelling results for the estimation of the impact of greening on farm's financial results . These results are presented for different greening scenarios and for number types of farms distinguished according to different criteria. The results refer to the average values for the specified farm types, so that the condition is met for presenting the results from the FADN system at the aggregation level not lower than 15 farms.

[1]FARM-OPTY model was developed in the Department of Economics and Organisation of Farms of the Warsaw University of Life Sciences.

All greening scenarios involve a decrease in agricultural income compared to the baseline reference model – the base Green_2014 scenario - by an average of 3.8 percentage points. In the case of scenarios Green_2014 and Green_ZB 2014, which differ in their interpretation of the term „crop", the drop in revenue is similar, reaching 3.8 and 4.0 percentage points respectively in the model farm population. The difference between the two variants of the model solutions is low mainly due to the high average degree of diversification of crops in Polish agriculture. Highly simplified structures of crops with a limited number of activities occur mainly in the relatively small group of cereal farms. Because of this, the variant that hypothetically is more strict, in which all the cereals are one „crop" of the allowable 70% share in the structure (Green_ZB 2014), is less favorable a for the most types of model farms than Green_2014 scenario. The exceptions are primarily cattle farms and mixed farms with a large proportion of cattle and farms with poor soils where agricultural incomes are rising slightly. This is due to the adoption of a seemingly reasonable assumption that at least in the first year of a greening policy, farmers will not be inclined to make more radical changes in the structure of production, if not necessary.

According to this assumption, in the model for the Green_2014 scenario, the model boundary conditions were specified in such a way that the possibility of introducing new crops to the crop structure was limited. In the models for these types in the Green_ZB 2014 scenario, due to the more restrictive boundary conditions for the proportion of cereals, it was necessary to loosen some restrictions on the model to allow for the introduction of new crops, especially rapeseed and legumes. Although it was assumed that the yield of new crops not previously existing on farms will be lower (by about 30%) compared to average values for a given type of soil, they were characterised by a higher gross margin compared to extensive cereals (rye, cereals mixes). As a result, agricultural income on these farms was slightly increased. On farms breeding cattle, the model optimised cattle breeding within the accepted limits, replacing part of the forage area on arable land (maize silage) with less expensive grass from permanent grassland.

The model results indicate that the highest costs of greening are in the types of arable and cereal farms, as well as on farms on good soils and on these types of farms, characterised by a low degree of adjustment to greening, especially on farms with crops in monoculture. The largest decline in agricultural income in the whole population under study concerns farms with crop monoculture on good soils on which the replacement in part of the most cost-intensive and profitable activities (wheat, rapeseed) lowers the income to about 77% compared to the Baseline reference solution.

On average, the Green (–30%)_2014 variant is far less favourable to farmers; it assumes the possibility of not complying with the requirements of greening and a 30% reduction in direct payments per farm. On the scale of the whole population, while leaving the structure of production and revenues as in the Baseline scenario, the decline of income is 9 percentage points. The differences in the size of agricultural incomes between scenarios result in changes in the share of direct payments in agricultural income (Table 1.8).

Due to the increase in prices of some agricultural products in the past few years (mainly cereals), agricultural income in the Baseline scenario and greening scenarios are on average higher than in the base scenario for 2009. Changes in prices are beneficial mainly to crop farms (increase in revenue by about 70%) and to a lesser extent to animal farms. Significantly higher incomes are also achieved on farms with good soil and on larger farms. This affects the proportion of direct payments – for all types of farms these are highest in the base scenario in comparable to the Baseline scenario and the greening scenarios. In the GREEN (–30%)_2014 scenario, the share of payments in income is

Table 2. Effect of greening on the level of agricultural income for the population of farms from the FADN sample. Source: own study

Types of farms	BASE-LINE_ 2014	GREEN_ 2014	GREEN_ ZB_2014	GREEN (–30%)_ 2014			
	Value in PLN	Baseline = 100	Value in PLN	Baseline = 100	Value in PLN	Baseline = 100	Value in PLN
According to types of production							
Cereal	168 817	100	157 848	93 ,5	157 254	93 ,2	148 189
Arable	97 162	100	90 480	93 ,1	92 758	95 ,5	87 119
Cattle	59 794	100	57 587	96 ,3	59 413	99 ,4	52 474
Pig	186 962	100	183 966	98 ,4	180 600	96 ,6	179 609
Mixed	63 308	100	61 374	96 ,9	61 392	97 ,0	57 278
According to economic size							
Small	22 660	100	21 710	95 ,8	21 657	95 ,6	19 854
Medium	67 983	100	65 115	95 ,8	65 711	96 ,7	60 546
Large	258 307	100	249 102	96 ,4	248 720	96 ,3	239 162
According to the degree of adaptation to greening							
D+E	59 980	100	59 582	99 ,3	59 262	98 ,8	59 932
D	96 038	100	92 500	96 ,3	93 071	96 ,9	87 022
50/50	112 614	100	106 877	94 ,9	104 060	92 ,4	103 335
MAIN+	91 661	100	87 507	95 ,5	85 153	92 ,9	82 956
MONO	115 830	100	99 976	86 ,3	96 964	83 ,7	105 738
According to soil quality							
Good	168 185	100	153 166	91 ,1	154 123	91 ,6	150 492
Medium	137 015	100	132 240	96 ,5	131 589	96 ,0	126 228
Poor	53 467	100	51 772	96 ,8	52 622	98 ,4	47 556
Population							
Total	95 035	100	91 383	96 ,2	91588	96 ,0	86461

significantly lower. This is due to the fact that with the same income from agricultural production as in the Baseline scenario, direct payments are reduced by 30% for failure to meet greening requirements.

Although the optimum solutions exclude the least profitable crops from production in a given type of farm, the aggregated production shows a decline for all crops. In the case of farms with good soil in which the intensive and most profitable crops grow, there is a relatively large decrease in the production of wheat, rapeseed and maize for grain. At the same time, due to the maximum allowed 70% share of the most important crop, less profitable plants are used in these farms to diversify cropping patterns. On farms with average and poor soil, plants such as cereals, rye, barley and oats, characterised by their relatively low profitability, are more often displaced by an ecological focus area than wheat and rapeseed. Despite their relatively low profitability, legumes are an attractive alternative to cereals on farms with poor soil, but in extreme cases, even on poor soil wheat and rapeseed enter the model solutions of crop structure.

An almost five-fold increase in the production of legumes in the Green_ZB 2014 scenario could give rise to doubts as to the feasibility of selling, even at low prices, such quantities of legumes. In light of the recent interpretation of the term „crop" in the greening proposals, this scenario should be treated as a benchmark, as the likelihood of its implementation in practice is negligible.

Summary

The reform of the EU's common agricultural policy (CAP) proposed for 2014–2020 covers many aspects, as evidenced by regulatory proposals for the new budget perspective.

Important elements of the reformed CAP will be the changes in the distribution of support measures for agriculture between Member States, the coverage of the increasing volatility of the market conditions with agricultural policy, and better targeting of measures aiming at addressing environmental challenges.

The current reform proposal assumes that the new CAP will address future challenges to the agricultural sector and will be compatible with the basic objectives of the CAP related primarily to:

- viable food production;
- sustainable management of natural resources and climate action;
- balanced territorial development (EC SEC 2011/1153).

The objectives of the reformed agricultural policy of the EU will be achieved through effective use of resources while maintaining agricultural support from the existing two pillars of the CAP. The documents of the European Commission conclude that „this reform accelerates the process of integration of environmental requirements. It introduces a strong greening component into the first pillar of the CAP for the first time thus ensuring that all EU farmers in receipt of support go beyond the requirements of *cross compliance* and deliver environmental and climate benefits as part of their everyday activities". Making 30% of direct payments dependant on greening is to ensure achieving these benefits through the retention of soil carbon, protection of species on permanent grassland (grassland habitats associated with permanent grassland), protection of waters and habitat protection through the establishment of ecological focus areas and the improvement of the resilience of the soil and ecosystems through diversification of crops.

Since the announcement of the European Commission's proposal, greening the CAP is the subject of intense and sometimes emotional debate. For many stakeholders involved in this discussion, the concept of greening seems controversial, either because it does not stress environmental objectives strongly enough, or because it imposes too restrictive limitations which interfere with the organisation of agricultural holdings. One of the important reasons for the existence of the controversy is the lack of reliable and comprehensive assessment of the effects of greening, in particular in relation to the expected environmental benefits. Although there are numerous positive effects of greening to the environment, including those mentioned in the Impact Assessment, they are merely of general regularity. At the same time, the expected effects have been assessed as doubtful due to the relatively stringent requirements of greening. For example, it is stressed that the diversification of crops in the sense of the European Commission's proposal is different from „crop rotation", which requires crop rotation in the sense of cultivating plants on a cycle of fields over the coming years. Thus, the benefits of the diversification of crops will not be of the kind that one would expect from agriculturally proper crop rotation.

Supporters of strong environmental protection are also critical of attempts to alleviate the greening requirements and of optional solutions that arise in the ongoing discussion, concluding that they would lead to the continuation of financial support for agriculture „without providing any environmental effects"[1].

As regards the issue of production and financial effects, the analyses made so far, including the estimates presented in this study for Polish agriculture, indicate that the agricultural sector of the European Union will bear the costs of greening, and will not be compensated in the short term by an increase in the productivity of production factors, nor by expected increases in prices of certain agricultural products. In the absence of any convincing arguments for the positive, long-term effects of greening, it seems rational to argue that this reform is in contradiction with one of the main objectives of the CAP, i.e. ensuring the viability of food producers. Moreover, it could mean a decrease in the share of EU agriculture in meeting the growing global demand for agricultural products.

The estimates of the effects of greening on Polish agriculture presented in this paper indicate that in the first year of

[1] "...keep pumping money into the pockets of farmers without any environmental delivery being assured". Ariel Brunner, BirdLife, "Leaked council paper suggests attempt to kill the greening of the CAP", Media Release, [Brussels, April 30, 2012].

implementing the reformed CAP, there would be a reduction in farm income by about 3–4 percentage points compared to the scenario without changes in the agricultural policy [Baseline_2014]. This would be primarily due to the exclusion of part of the arable land in order to create ecological focus areas, as well as due to the changes in crop structure which are necessary in order to meet the condition of crop diversification. The analysis, carried out on the basis of the European Commission's initial proposal, known as the „integration scenario", assumes several variants of greening scenarios. The results of calculations relate to 2014, adopted as the first year of the CAP reform. In determining the parameters for the model calculations, it was established that compared to the Baseline scenario (no greening), adjustments to greening requirements will have an impact on changes in the structure of production, but will not cause significant changes in the development of the agricultural product prices and costs.

The results of the analyses are presented for different types of farms selected from the FADN farm population after aggregation with the SYS02 parameter and, in the synthetic approach, in the scale of the general population of farms represented by the analysed part of the FADN population. In the process of aggregation, the results obtained for individual types of farms have been averaged. As a result, the differences in the crop structure between the scenarios for aggregated values are smaller than those observed at the level of the modelled individual types of farms.

A comparison of the results indicates that the most advantageous to the farmers, in terms of the level of agricultural income, would be a continuation of the current CAP [Baseline_2014]. Implementation of the requirements of greening the CAP results in a slight decrease in agricultural income for the population of farms analysed (3-4 percentage points). On average, it is not a rational choice not to comply with the terms of greening, thus losing 30% of direct payments (this would lead to a decline in agricultural income by an average of 9 percentage points). The exception to this rule are arable farms with good soil, where a reduction in the area used to grow highly profitable crops and the diversification of cropping patterns would lead to a decreased revenue, despite obtaining the full rate of payment.

In view of the relatively high degree of diversification of crops in Polish agriculture, except for some crop farms, the main determinant of changes in plant production is the need for delimitation of an ecological focus area. Assuming that the estimated size of the ecological focus area is now on average ca. 1%, this means that almost 6% of arable land would have to be excluded from agricultural use.

While diversification leads to shifts in crop structure, the requirement of 7% of the farm's total area to become an ecological focus area is the main driving force of the decline in agricultural income and reduced production in Polish agriculture. This condition is particularly controversial given the fact that in Poland there is a relatively small amount of good soil in the structure of arable land. Farms on good soil have a significantly lower percentage of areas recognised as ecological focus areas than farms with poor soil. With regard to the efficiency of using production factors, this is an irrational action which serves to weaken the competitiveness of agriculture in the EU.

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DIVERSIFICATION STRATEGIES AND THEIR IMPACT ON FARM PERFORMANCE

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Abstract: The objective of this study is to identify factors determining the economic performance of agricultural holdings in Italy, with specific attention to the impact of the adoption of on-farm diversification strategies, namely income diversification and product differentiation. The adoption of these kinds of strategies has been increasingly recognised as a viable business option in agriculture as they allow better allocation of farm resources and an increase in the quota of value added retained on farms and therefore not passed on to other agents operating at the end of the food supply chain.

By using a panel of professional Italian farms over the time period of 2003-2009, we estimate random effect, ordinary least square and quantile regression models to estimate the impact of income diversification and product differentiation strategies on the levels of farm income per unit of labour income.

Our findings show that scale economies are important positive determinants of farm economic performance. On the contrary, when the family play an important role in the farm business, economic performance is worse. Finally, we do not find evidence of a statistically significant impact of the adoption of income diversification and product differentiation strategies. This latter result may be interpreted as a signal that farms use these strategies as risk management tools rather than as income increasing ones.

Key words: farm income, income diversification, product differentiation

Introduction

Low incomes, alongside overcapacity and low prices, is one of the main traits of historic farm problems (Gardner, 1992). Low farm incomes are mainly due to supply and demand side limitations (e.g. demographic ageing, limited access to land and capital, seasonal nature of agricultural activities) affecting the structure of agriculture, as well as technological changes that progressively worsen the price-cost squeeze. The solution suggested by economic theory to overcome low farm incomes is based on growth and specialisation in order to take advantage of economies of scale and scope. In respect to the adoption of these two strategies, often referred to as productivism and modernisation, the Italian agricultural sector, as well as the agricultural sectors of other Mediterranean countries, has often been considered as paradigmatically "difficult". This is because the traditional features of Mediterranean agriculture – the small size of farms, location in harsh geo-climatic conditions, and the high relevance of part-time and ageing farmers – make the adoption of productivistic and modernisation solutions difficult (Arnalte-Alegre et al., 2013)

Over time, increasing evidence of the lack of economic, environmental and social sustainability of modern agriculture has stimulated the shift to value-added augmenting and income diversification strategies rather than quantity-dominated productivistic strategies (Van Huylembroeck and Durand, 2003). Business strategies aiming to increasing the value added per unit of the overall agricultural products are mainly based on product differentiation, which is the case of farms producing high-quality or speciality food, for example Protected Designation of Origin (PDO), Protected Geographical Indication (PGI) or organic food. On-farm income diversification activities include agri-tourism, energy production (photovoltaic, wind-powered, etc.), natural resource management, on farm processing and marketing.

Product differentiation and income diversification strategies, in consideration even of the financial support granted under the Common Agricultural Policy, have been increasingly adopted by Italian farms. Previous works have analysed the diffusion of differentiation and diversification strategies in Italy (Belletti et al., 2003; Esposti & Finocchio, 2008; Henke & Salvioni, 2008). Overall, results show that product differentiation, processing and direct marketing are very widespread on Italian farms, while the diversification in non-farming activities – e.g. tourism, green care, educational and recreational activities - is still relatively infrequent so far, although rapidly spreading.

The aim of this paper is to provide empirical evidence about factors which contribute to income creation in agricultural holdings in Italy, with specific attention to the role played by income diversification and product differentiation strategies.

The article is organised as follows. The first session describes the data used for the analysis. Session two describes the problems arising when OLS regression is used to fit data characterised by pronounced asymmetry and the presence of outliers, and how quantile regression can be used to tackle the problem. In the last session we present the results, draw conclusions and present plans for future work.

Data

This study relies on data collected by the Italian Farm Accountancy Data Network (FADN) survey. The field of observation is the total of commercial farms, which are farms with an economic size greater than 4 European Size Units (ESU), corresponding to a Standard Gross Margin of around 4,800 Euro.

The FADN survey provides information revealing the adoption of differentiation and diversification strategies. For example, it is possible to ascertain whether the farm engaged in organic farming, or if it provides agri-tourism, commercial (direct selling) or social (educational or green care) services. In addition to these, FADN provides information about the use of PDO, PGI or traditional products (IGT).

Starting from year 2008, the survey also records information about the value of total production due to (a) PDO, organic and other products covered by quality certification, and to (b) the provision of agri-tourism, recreational and educational activities, on-farm processing (e.g. wine and cheese) and other services.

This information has been used to sort farms into homogeneous groups in terms of economic size and of the effort of the farm in the area of product differentiation and on farm income diversification. The aim of this typology is to provide a consistent basis for the description of the main characteristics of distinct groups of farms and of their performance over time. The cut-off criteria used to classify the FADN farms in these homogeneous groups were based on expert judgement and then further elaborated with the aim of reducing the complexity of the original typology (Salvioni et al., 2013).

The proposed typology builds on a simple two-step approach. First, we select all farms which recorded a total output of less than 15,000 Euro and define them as micro farms. We further sort the remaining non-micro farms into three groups by the magnitude of their efforts in terms of income diversification and product differentiation. The first group refers to the diversified farms and covers farms with a total output larger than 15,000 Euro and at least 30% of gross production originating from non-farming goods and services. The second group, called differentiated farms, covers farms with at least 30% of total output originating from the production of high quality, certified products. The last group includes all the remaining non-micro farms, i.e. farms with a total output larger than 15,000 Euro where less than 30% of the total output was gained from the use of strategies of either income diversification or product differentiation. We refer to this group of farms as conventional. It is worth noting that the term conventional is not used in opposition to organic or other alternative farming practices, but rather refers to a farm that is producing only non high-quality certified agricultural products.

In order to assess the impact of the adoption of product differentiation and income diversification strategies on the economic performance of farms, we applied the above-defined typology to a 7 waves balanced panel of more than 3,000 Italian farms for which continuous records are available for the period from 2003 to 2009.

The economic performance of the farms is measured by Farm Net Value Added (FNVA) as well as by annual work unit (AWU). FNVA represents the remuneration of all production factors (land, capital and labour). It is obtained by deducting total intermediate consumption (farm-specific costs and overheads) and depreciation from farm receipts (total output and public support). When expressed per AWU, it takes into account differences in the labour force to be remunerated per holding.

Figure 1 depicts the distribution of Farm Net Value Added per working unit in the panel of data. It is easy to see that the distribution is very skewed; in addition, it is characterised by long tails, i.e. by the presence of many outliers.

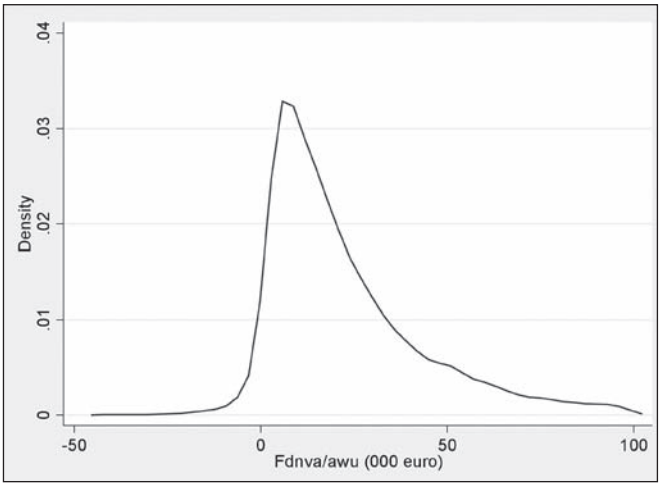

Figure 1. Kernel density estimate of Farm Net Value Added (FNVA) by annual work unit (AWU) (1000 Euro).

Source: our elaborations on FADN data.

Econometric strategy

Two econometric models are employed in this study. The first is the linear regression model, based on ordinary least squares (OLS) estimation. The second is the quantile regression (QR) model, which presents robustness against outliers and asymmetry, clearly shown by the distribution of our response variable (Figure 1).

The QR model was developed in the 1970s by Koenker and Bassett (1978) as an extension of the linear model for estimating rates of change in all parts of the distribution of a response variable, providing a thorough description of the distributional effects. Conditional quantile regression pertains to the estimation of unknown quantiles of an outcome as a function of a set of covariates and a vector of fixed regression coefficients.

Given a response variable *y* and a design matrix ***X,*** the conditional quantiles, denoted by $Qy(\tau|X)$, where $\tau\in[0,1]$ denotes the given quantile, are the inverse of the conditional cumulative distribution function of the response variable, $F\text{-}1(\tau|X)$.

In the linear QR model, the conditional quantiles are expressed as linear functions of the observed covariates. Considering data in the form x_iT,y_i, for i=1,…,n, where xiT are row *p*-vectors of a known design matrix **X** and y_i is the scalar measurement of a continuous random variable on the *i*-th subject, the linear conditional quantile function for the τ-th quantile is defined as: $Qy_i\tau x_i=x_iT\beta(\tau)$, where $\beta(\tau)$ indicates that the parameters are for a specified τ-thquantile.

Parameters in linear QR models have the same interpretation as those in any other linear model. They are rates of change conditional on adjusting for the effects of other variables in the model, but are now defined for some specified quantile. Each element of the parameter vector $\beta(\tau)$expresses the marginal change in the τ-th quantile of the response variable due to a 1-unit change in the associated covariate, leaving the others unchanged.

In the last few years, the need for extending QR for independent data to clustered data has led to several quite distinct approaches. In fact, a number of sampling designs such as multilevel, longitudinal and cluster sampling typically require the application of statistical methods that allow for the correlation between observations that belong to the same unit or cluster. In such cases, the within-subject variability due to the measurements on the same subject should be accounted for to avoid bias in the parameter estimates.

Geraci and Bottai (2007), in the framework of mixed effect models, extend the quantile regression to longitudinal data and propose a likelihood-based approach, based on the asymmetric Laplace density, for the estimation of the parameters of conditional quantile functions with subject-specific, location-shift random effects.

Given repeated measurement data in the form $x_{ij}T,y_{ij}$, for j=1,…,ni, and i=1,…,n, the linear mixed quantile functions can be defined as:

$$Q(y_{ij}|u_i)\tau x_{ij},u_i=x_{ij}T\beta\tau+u_i$$

where ui represents a location-shift random effect.

Geraci and Bottai (2007) assume that y_{ij}, conditionally on u_i, for j=1,…,ni, and i=1,…,n, are independently distributed according to an asymmetric Laplace density, $y_{ij}|u_i\sim AL\mu_{ij},\sigma,\tau$ with $\mu_{ij}=x_{ij}T\beta\tau+u_i$. The random effects induce a correlation structure among observations on the same subject. The u_i are identically distributed according to some density characterised by a τ-dependent parameter, $\varphi(\tau)$, and they are mutually independent.

Considering $y=(y_1,\ldots,y_n)$, where $y_i=(y_{i1},\ldots,y_{ini})T$, and $u=(u_1,\ldots,u_n)$, the joint density of $(y,\mathbf{u})$ based on *n* subjects is given by

$$fy,u|\eta=\inf y_i|\beta(\tau),u_i,\sigma\ fu_i|\varphi(\tau))$$

where $\eta=(\beta\tau,\sigma,\varphi\tau)$ are the parameters of interest. The likelihood is numerically integrated via Gaussian quadrature techniques.

The classical least squares (OLS) regression method shows us how the conditional mean function of *the income per working unit* changes with the vectors of covariates. Given that when the distribution of the response is skewed, OLS regression may result in misleading regression coefficients (Reeves and Lowe, 2009), and that OLS regression is also very sensitive to outliers, in this article we apply quantile regression, the results of which can providew a more nuanced view of the stochastic relationship between variables, hence a more informative empirical analysis. One of the advantages of quantile regression over OLS regression is that quantiles are robust with regard to outliers (Koenker and Hallock, 2001), where a robust statistical test is one that performs well even if assumptions are violated by the model from which the data were generated.

More specifically, quantile regression can be employed to explain the determinants of the dependent variable at any point of the distribution of the dependent variable. In this study, given the longitudinal nature of the data, we consider five linear quantile mixed models at the 10th, 25th, 50th, 75th and 90th percentiles. Computations have been performed using the package lqmm (Geraci, 2012; Geraci and Bottai, 2013) for the statistical programming environment R.

In order to compare the QR results with the OLS approach, we also estimate a random coefficient linear regression model to account for the dependency in the repeated measures of the panel data used in the analysis. The model has been estimated using the package lme4 (Bates et al., 2009) for the statistical programming environment R.

In this paper we estimate the model for real factor income per annual working unit as dependent variables. The covariates include farm idiosyncratic characteristics (size both in hectares of utilised area land and working units, family to total working unit ratio, owned to total land ratio, a dummy for sole ownership and one for organic farming); the dummies for the typological groups sorted by economic size and involvement of the farm in product differentiation and income diversification activities (micro, diversified, differentiated and conventional as a base); dummies for the type of farming (horticultural, trees, livestock, mixed and arable crops as a base); dummies referred to altimetry (hills, plain and mountains as a base) and to the geographic location (North East, Centre, South with North-West as a base). The summary statistics of the variables used in the analysis are reported in table 1.

Table 1. Summary statistics

			Median	Mean	Std
Dependent variable	Income per annual working unit (Iawu)		17.3	28.9	137.2
Farm characteristics	Utilised agricultural area (*ha*)		11.3	33.5	64.8
	Annual working units (awu)		1.5	2.1	3.0
	Family awu to total awu ratio		1.0	0.8	0.3
	Owned to total land ratio		0.9	0.7	0.4
		Percentage	Median Iawu	Mean Iawu	Iawu Std
Farm characteristics	Sole ownership	87.9%	15.8	24.5	33.6
	Other legal status	12.1%	34.5	60.6	382.9
	Organicfarming	4.9%	17.6	29.4	43.4
	Non- organic farming	95.1%	17.3	28.9	140.3
Farm typology	Conventional	72.4%	20.5	33.2	159.6
	Micro	15.6%	5.9	8.2	11.2
	Diversified	5.4%	16.7	23.7	26.0
	Differentiated	6.6%	22.4	35.0	60.6
Type of farming	Arable	23.7%	16.9	29.3	41.2
	Horticultural	9.4%	14.8	24.1	31.9
	Permanent crops	30.1%	16.3	23.8	28.8
	Livestock	21.2%	24.2	41.6	289.8
	Mixed	15.6%	13.4	23.7	35.2
Altimetry	Mountains	20.5%	18.9	24.5	24.6
	Hills	44.7%	15.0	24.9	35.4
	Plains	34.8%	19.3	36.7	228.0
Geographic area	North west	20.3%	18.1	29.1	38.6
	North-East	32.7%	17.1	29.2	49.5
	Centre	17.4%	15.1	23.7	30.3
	South	29.6%	18.2	31.4	243.6

Source: our elaborations on FADN data.

Results and conclusions

The coefficients and levels of statistical significance of the estimated OLS and QR models are reported in table 2.

The coefficients of variables referred to the diversification and differentiation strategies are not statistically significant, neither in OLS regression nor quantile. A first possible explanation for these unexpected results is that the small number of observations in which differentiation and diversification strategies have been adopted is the cause of these non-significant estimates. Second, it may indicate that these strategies are risk management tools rather than profit-maximising strategies. In other words, farms may adopt them to stabilise rather than to increase farm income.

The coefficients of farm size in hectares, total working units and specialisation in animal breeding are statistically significant across all quantiles. In more detail, the parameters estimated for size are small but increasing, passing from the 10th to the 90th percentile, this result suggesting that scale economies are more important as determinants of economic performance in better performing farms. On the contrary, being more labour intensive penalises better-performing farms more than it does worse-performing farms. Specialisation in animal breeding has a positive impact at all levels of performance, especially in the 25th and 90th percentiles.

It is also worth noting that a number of variables vary considerably across the OLS and QR estimates—both in terms of magnitude and significance.

For example, a larger amount of family work is found to have a negative impact only in worse-performing farms. On the contrary, a larger proportion of owned on total land, hence a lower use of rented land, penalises only better-performing farms. It is interesting to note that the coefficient estimated for sole ownership is statistically significant in the OLS regression, but this could be a biased result since no significant impact is found in the quantile regression estimates. Similarly, the OLS coefficients for specialisation in the production of horticultural crops and trees are not statistically significant, while the quantile regressions find that these specialisations have a statistically significant positive impact in higher quantiles.

Having a small economic size, i.e. being a micro farm, is the most penalising determinant of farm performance, especially on higher levels of economic performance.

Other cases in which coefficients vary are those of hills and the South. The parameter of these two variables in OLS regression are significant and positive. They are similar in magnitude to the estimates obtained for the 25th quantile, while no statistically significant impact is found in other quantiles.

Overall, our findings show that scale economies are important positive determinants of farm economic performance. On the contrary, when the family play an important role in the farm business, economic performance is worse. Finally, we do not find evidence of a statistically significant impact of the adoption of income diversification and product differentiation strategies on farm income. As already mentioned, this may be partly due to the use of categorical variables to control for the role played by these strategies on farm economic performance. In future work

we intend to elaborate by the use of a continuous variable to measure the extent of diversification and differentiation in the business in order to better tackle the question about the role played by these strategies on farm performance.

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RESEARCH ON THE NATURAL FEATURES OF KARST WATER, ON THE EXAMPLE OF SOME WATER INTAKES

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Abstract: The existence of safe and abundant raw water sources is a priceless treasure for any country. Water resources are of particular importance for Montenegro, especially for the development of tourism and agriculture which represent the backbone of its economic development. With respect to water potential, Montenegro is at the top of Europe. However, it is not a sufficient factor, but the very way it is used and protected, as well as the improvement of its valorization. Economic development which is not based on the conservation and good governance of natural resources may have negative consequences for the overall development.
The aim of the paper is the study of natural properties of karst ground waters and their changes through interrelation of some ions, as indicators, on the example of five intakes in use. The paper presents the results of the research on the said waters and the values of indicators which point to their exceptional benefits for the water supply. However, the effects of the anthropogenic factor are evident, which are reflected in the range of the mole ratio of Ca /Mg ions ranging from 5.4 to 9.6, and the values (eqv.SO4/Cl) ranging from 0.3 to 2.0. Protection of the environment, especially preservation of the quality of water resources of Montenegro, imposes the urgency of implementation of the objectives of the Water Framework Directive.

Key words: water *characteristics, water intake,* water management

Introduction

In its natural condition, water is essential for the survival of all living beings, but as such it is not available nowadays in many parts of the world. Some analysts put the access to water on a level with basic human rights. Gleick for example, recommends that "50 liters of pure water per person daily should be considered a fundamental human right today" (Gleick, 1995). Water is not only a natural but also a socio-economic resource with characteristics which classify it parametrically as pure public, private, mixed and meritorious goods.

Fresh water is a vulnerable resource, which is essential for life sustention, development and the environment. Therefore, a large number of authors (Dimkic and Milovanovic, 2009) believe that water management, based on the principles of integrated management, is a prerequisite for its protection. According to Stevanovic (2011), management of groundwater resources in karsts areas is of essential importance. Compared to other porous environments, karsts aquifers are unpredictable, but much more vulnerable to the occurrence of pollution. Hydro geological characteristics of these environments cause a very rapid circulation of groundwater, and therefore the shortest retention of water in the underground, and low self-purifying ability. The water from more than 75 water intakes from the karst underground of Montenegro is used for the purposes of the municipal water supply system. Pollution is particularly noticeable at the time of significant intense short-term precipitation, which is most evident in the coastal region of Montenegro and its immediate hinterland.

The aim of the paper is the study of natural properties of groundwater in terms of the reflection of the unique characteristics of water sources on physical-chemical properties, on the example of the intakes for the water supply of Budva. The purpose of the paper is to encourage the implementation of the objectives of the Water Framework Directive (defining of water bodies, monitoring, and other elements), which are a prerequisite for the integrated water management in Montenegro.

Method of work

Within hydrogeological research, the properties of the following groundwater intakes used for the water supply of the Coastal region were monitored: Piratac-label 1; Rezevica Rijeka- label 2; Loznica- label 3; Podgorska vrela- label 4. The capacity of the mentioned water intakes is 257 l / s. During the summer period, this quantity is significantly increased

by the water of the intake "Bolje sestre" through the regional water supply system. During field examination of the drainage basins of the intakes, among other things, 53 "instantaneous" water samples were taken for laboratory tests (APHA 1995, 2005). As indicators of anthropogenic influence, mole ratios of Ca/Mg and ekv.SO4/Cl were used.

According to many authors, (Patrick, 1976; Preka-Lipold et al., 1984, Langmuir, 1971, Thrailkill, 1976) that ratio, among other things, is an indicator of the impact of chemicals in plant production on the changes in natural properties of waters. Thus, according to Buljan (1962) the ratio of sulfate to chloride suggests the influence of fertilizer ingredients from land surfaces. Moreover, the ratio Ca / Mg <1, for example, points to the penetration of fertilizer ingredients into fresh water (Rahman and Rowell, 1979).

In the case of soil salinity, the consequence is the dominance of Ca2 + in fresh water, resulting in a higher mole ratio of Ca/Mg in water than 3.5 (Howard and Adams, 1965; Carter and Webster, 1979; Mostafa and Ulrich, 1976). According to Aljtovski (1973), the ratio in fresh water is 3.6, while smaller or larger ratio points to the influence of sea water, or other man-made factors, such as fertilizers. In fresh natural water this ratio is in the range from 2.1 to 3.4, while it is 3 in waters of distinctly karst terrains (Geochemical et Cosmochemical Acta, 1971).

The research data was analyzed with the statistical package "Excel". The correlation analysis was performed in order to evaluate the interdependence of physical and chemical indicators of water quality. The degree of interdependence between ions in water is expressed through simple correlation coefficients and tested for the significance level of 5%.

The basic data on the physical and chemical characteristics of tested waters in these water sources are shown in Tables 1, 2 and 3 and Figures 1 and 2.

Results and discussion

In terms of elemental composition, the tested waters belong to the calcium bicarbonate type, with a slightly marked alkaline character and a relatively low content of dissolved salts, as well as a very low content of micro elements, which makes them very suitable for drinking.

The data presented in Table 1 show extreme and mean values of physical-chemical parameters of the waters from the intakes labeled from 1 to 4. These are waters of a suitable water temperature from 12.5 ° C to 13.2 ° C, enriched with dissolved oxygen (Xsr = 15.2mgO2 /l.). The water from these intakes is odorless and colourless, has the characteristic taste and a very low content of organic matter (Xsr = 2.3mgKMnO4 /l). The said waters occasionally become turbid to a greater or lesser degree, usually at the end of a dry period, after abundant rainfall, which is also a characteristic of the intakes of a significantly larger capacity, such as the "Mareza" water source (Corovic, A. et all.1999; Filipovic et al., 1993; Krivokapic, Filipovic, 1995.). During the period of low water levels, the hardness of water is very stable (Xsr = 10.8odH) in the water of the water intake – 2 of a higher capacity, while in others, it slightly varies, which is explained by the pressures in the sanitary protection zones.

Table 1: Extreme and mean values of physical-chemical parameters of the raw karst water of the water intakes labeled (1 to 4).

Test Parameters	max	Min	Xsr
Temperature 0C	13.2	12.5	12.9
Odour	without	without	without
Color (oCo – Pt. scale)	<5	<5	<5
Turbidity (NTU)	0.85	0.29	0.44
Ammonium – NH4 (mg/l)	<0.05	<0.05	<0.05
Nitrite N (mg/l)	<0.005	<0.005	<0.005
Nitrate N (mg/l)	1.43	1.33	1.39
Fluoride (mg/l)	0.040	0.025	0.036
Chloride (mg/l)	9.5	6.5	8.8
Consumption $KMnO_4$ (mg/l)	2.55	1.92	2.29
Total hardness ^{0}dH	11.9	10.2	10.8
Carbonate hardness ^{0}KdH	10.6	9.5	9.8
Oxygen O_2 (mg/l)	15.5	15.0	15.2
pH value	7.78	7.52	7.70
Conductivity (µS/cm)	302	253	265
The rest of the vapor (mg/l)	218	201	210
Iron (mg/l)	0.08	0.05	0.06
Copper (mg/l)	0.003	0.003	0.003
Manganese (mg/l)	0.006	0.003	0.005
Zinc (mg/l)	0.01	0.01	0.01
Lead (mg/l)	<0.005	<0.005	<0.005
Chromium (mg/l)	<0.003	<0.003	<0.003
Nickel (mg/l)	0.015	0.008	0.010
Cadmium (mg/l)	<0.001	<0.001	<0.001
Mercury (mg/l)	<0.0005	<0.0005	<0.0005
Alkalinity (M) $CaCO_3$ mg/dm^3	190.1	170.1	175.1
Sulfates (mg/l)	25.6	5.8	10.7
Bicarbonate (mg/l)	231.8	207.4	213.5
Aluminum (mg/l)	<0.02	<0.02	<0.02
Detergent anions (mg/l)	<0.05	<0.05	<0.05
Orthophosphate (mg/l)	<0.05	<0.05	<0.05
Sodium (mg/l)	4.59	4.23	4.50
Potassium (mg/l)	0.514	0.320	0.466
Calcium (mg/l)	84.0	62.8	78.7
Magnesium (mg/l)	7.05	4.62	5.23
The mole ratio of Na/K	22.4	15.1	17.0
The mole ratio of Ca/Mg	11.0	5.4	9.6

In order to highlight the pressures on the basin of the intakes (Piratac-1, Rezevica Rijeka-2; Loznica-3 and Podgorska vrela-4), Figure 1 presents the values of the hydrogen exponent and the mole ratio of the ions of alkali elements (Na / K), which are not factors of the total hardness, and earth alkaline ions (Ca / Mg), as its dominant factors.

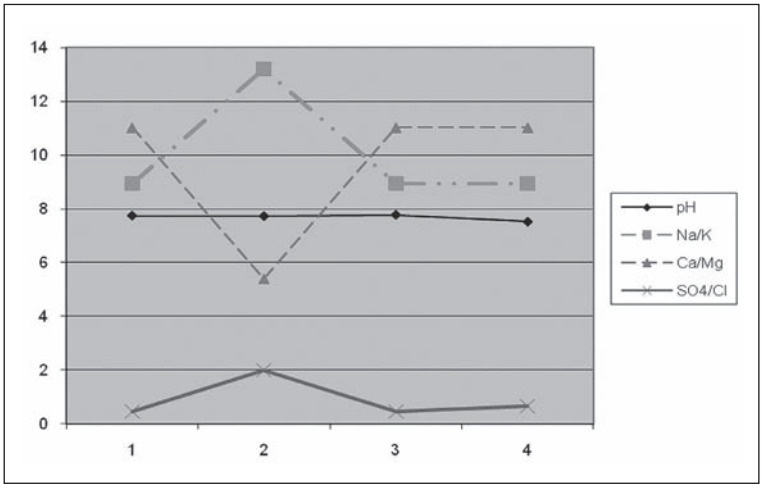

Figure 1: Average values of pH and the mole ratio of alkali and alkaline earth elements

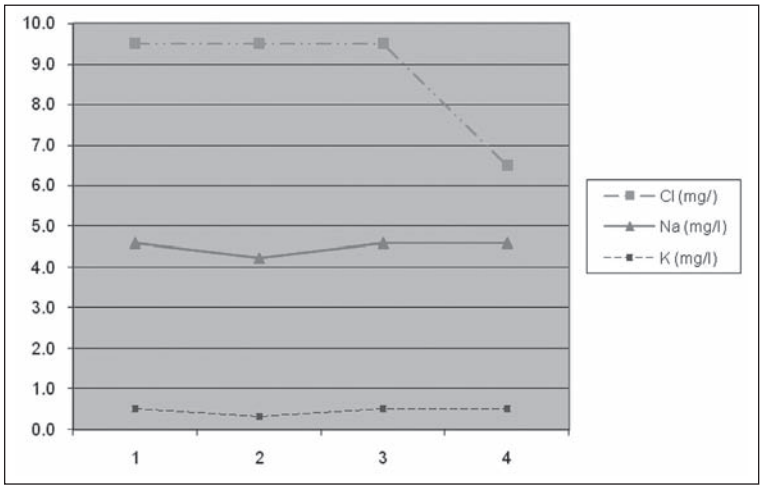

Figure 2: The behavior of the values of Na, K, and Cl in the water of the intakes

As we can see from the figure, depending on the water intake, changes in the value of the hydrogen exponent are insignificant, which is reflected in the extreme pH values from 7.52 to 7.78. In contrast, changes in the values of the mole ratios of Na/K and Ca/Mg ions by different sources are noticeable, indicating the obvious impacts of pollutants from the land surface of the basin.

Comparing the obtained values of the mole ratios Ca / Mg of the water of the water intake "Podgorska vrela"-4, for example, to a previously determined value of 3.7 (Filipovic, 1991), it can be argued that the level of protection of this water source has still not improved.

Figure 1 also indicates that the water quality of "Rezevica Rijeka" -2 differs from the water quality of other intakes, which is indicated by the determined contents of sodium and chloride (Figure 2). This phenomenon is explained by a significantly larger drainage basin area and the pressures in the basin. The obtained values or the mole ratio of SO_4/Cl ions (Figure 1) indicate an excessive use of fertilizers, that is, their ingredients are most common in the established pollution in the basin area. Disturbance of constant natural balance (buffering capacity) of water endangers its biological value, as well as the organic food production.

Exploring the water of the water intake "Bolje sestre" also indicates that the change of natural characteristics has occurred. This is reflected in the values of the basic indicators of quality, particularly in the obtained range of the mole ratio Ca/Mg ions and ekv.SO_4/Cl (Table 2).

As seen in the table, the ranges of extreme temperature values, pH values, and electrolytic conductivity are significant, while the ranges are lower for other parameters. The determined values of presented quality indicators are reflected in the very high range (from 2.1 to 18.8) for the mole ratio Ca / Mg, than it is in the case of the mole ratio ekv.SO_4/ Cl from 0:33 to 1:20. The determined state points not only to the penetration of fertilizer ingredients, but to the ingredients of industrial origin.

In relation to this, it should be noted that the water source "Bolje Sestre"is situated at the far northwestern edge of Lake Skadar. The wider area of the basin where precipitation intensity ranges from 34-231mm for the period 1971–1990, is built of carbonate rocks represented by limestone, dolomitic limestone and dolomites of the Jurassic and Cretaceous age. These are very permeable rocks characterized by cavernous and fracture porosity. Through various geologic methods a large number of faults with different directions were determined, among which the most notable are the faults at the eastern edge of Malo blato (Devic et al. 2011).

Comparing the determined range of values (2.1–18.8) of the mole ratio Ca / Mg, for the water of the water intake "Bolje sestre" with the range (1.6–22.8) for groundwater and surface water of the Skadar Lake basin (Djuraskovic and Tomic, 1997), it can be said that the waters of this basin are burdened with identical pressures.

Table 2: Extreme and mean values of some indicators of water quality

Label	Ext. and mean values	T °C	pH	EC_{25} µS/cm	°dH	mol Ca/Mg	Na^+ mg/dm³	K mg/dm³	ekv. SO_4/Cl	NO_3 mg/dm³	PO_4 mg/dm³
Water intake "Bolje sestre"	min	11.5	7.3	260	8.0	2.1	0.9	0.2	0.33	1.72	0.01
	max	14.8	8.1	310	9.7	18.8	3.2	1.5	1.20	2.44	0.08
	Xsr	13.2	7.6	281	8.9	7.2	2.0	0.6	0.76	2.01	0.04

In order to examine the interdependence of other physical-chemical indicators of the characteristics of the quality of natural, karst water of the said intakes, a correlation analysis was performed (Table 3).

Table 3: Values of the correlation coefficient (r) of some quality parameters of raw water

Correlation coefficient (r)	pH values	Na (mg/l)	Cl (mg/l)
pH value	–	–0.197	0.985
Na (mg/l)	–0.197	–	*–0.333*
K (mg/l)	–0.197	*1.000*	*–0.333*
Ca (mg/l)	–0.197	*1.000*	*–0.333*
Mg (mg/l)	0.197	*–1.000*	*0.333*
Cl (mg/l)	*0.985*	–0.333	–
Total hardness ^{0}Dh	*–0.957*	0.362	*–0.945*
Consumption of $KMnO_4^-$ (mg/l)	*–0.525*	*0.849*	*–0.587*
O_2 (mg/l)	*–0.529*	*–0.931*	*0.490*
Alkalinity (M)	0.197	*–1.000*	*0.333*
Conductivity (µS/cm)	0.197	*–1.000*	*0.333*
Nitrate – NO_3^- (mg/l)	–0.426	0.174	*–0.522*
Sulfate (mg/l)	0.197	*–1.000*	*0.333*
Fe (mg/l)	*–0.876*	*0.639*	*–0.938*

As seen in Table 3, the average pH values of water have a very negative effect on total hardness, then iron, dissolved oxygen and consumption of potassium permanganate, while the effect of pH on the ions of sodium, potassium and calcium is negligible.

The positive reaction of pH value is with: total alkalinity, electrolytic conductivity, magnesium and sulfates. A significant positive relationship (r = 0985) is between pH and chloride. A high dependence level (r = 1) in water is between sodium and calcium, as was found in karst water from other areas (Devic and Filipovic, 2005). A strong negative correlation between sodium and magnesium, and sodium and sulfate, can also be noticed, which clearly shows the inflow of fertilizer ingredients into the water of the intakes.

Conclusion

Reconnaissance of the subject water sources has proved that their protection is not at a high level. This is proved by the data of field and laboratory study of 53 "instantaneous" water samples from five water intakes for the water supply of Budva. The values of the used indicators show the extent of changes of the natural properties of water that have occurred. It is concluded that the present condition is a consequence of the inflow of pollution into the waters from the land surface of the basin areas. This is reflected in the increase of buffering capacity of water, expressed by a significant exchange of bicarbonate ions with carbonate ions, which is most affected by a higher content of alkali and alkaline earth elements, as well as chlorides, sulfates and phosphates in a lower degree. The phenomenon caused by fertilizer ingredients in plant production does not exclude the impact of other sources of pollution, which is still in accordance with hygienic regulations.

Inadequate management of water resources that Montenegro has can in the long run have negative effects on the overall development. A potential vulnerability of water source areas is only part of a much broader and deeper issue that need to be addressed systematically, respecting the EU recommendations and regulations. The demonstrated vulnerability of the water source areas points to the need for active intervention in water protection. Everybody must be involved in resolving this issue, starting from state institutions, through public and private companies, educational institutions up to the individual themselves. Protection of the environment, raising environmental awareness among the population and the regulation of the situation in the field of environmental management are essential priorities of the society that strives for development. Water is a valuable resource that Montenegro has available and it must be preserved and exploited through active protection measures in the function of economic and overall development.

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THE EFFICIENCY OF PORKERS PRODUCTION OF INTENSIVELY AND EXTENSIVELY FEEDED

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Abstract: The aim of this study is a comparative analysis of the costs of production of intensively and extensively fed porkers in view of the qualitative parameters of meat obtained after slaughter. The production experiment, which involved the parallel fattening of 3 groups of 30 porkers (fed intensively up to a weight of about 120 kg and extensively up to weights of about 100 kg and 120 kg), was carried out between 2011 and 2012 in a deliberately selected farm. The researchers assumed average prices of the means of production and prices of livestock pigs in individual meatiness classes noted in Poland in 2012. The fattening started when the animals weighed about 40 kg. The feeds used for extensive fattening contained less total protein, energy and basic exogenous amino acids, but more raw fibre. The analysis proved that the extensive production of porkers up to 100 kg in 2012 was not profitable. The most profitable production was the intensive production up to 120 kg (a profit of €0.100 per kg, whereas in the extensive feeding up to 120 kg the profit was €0.072 per kg. The porkers which were fed less intensively had a higher slaughter value, thinner fatback, higher dressing percentage and smaller content of fatback in the half-carcase, whereas their meat contained more water and less protein, fat and ash than the meat from the group of porkers fed with the mix richer in protein and energy.

Key words: pigs, cost effectiveness, extensive production

Introduction

Pork is the most commonly consumed meat around the world, but in the near future we should expect further decreases in the growth rate of meat production and further increases in the significance of poultry at the expense of beef and, to an extent even larger than now, at the expense of pork. Undoubtedly, this situation will be favoured by the lower production costs of poultry meat and the process of the replacement of pork with poultry meat, chiefly due to the fact that poultry meat is regarded as healthier than red meat (beef and pork). This process can be observed in Poland, where the population of pigs has been falling rapidly since 2006 (from 18.88 million to 11.13 million pigs at the end of 2012, a decrease of more than 41% (Central Statistical Office 2006, Central Statistical Office 2012) to the level of the 1950s. The diminishing of the pig population by as much as half has taken place in almost all Eastern European countries, but in Poland it occurred latest. The causes of the situation can be explained through aspects such as the strong fragmentation of production, low productivity of sows, high consumption of feeds, and low standards of agricultural counselling (Pepliński et al. 2012), resulting in the low competitiveness of those countries on both domestic and international markets. In view of this fact, farmers in those countries should seek alternative markets for their products. In Poland many small producers still produce pigs using traditional methods. If separate channels of processing and distribution are organised and if there is appropriate certification and control, there is a chance to create a new segment in the market, which will be a good alternative to organic products, which are on average 30–50% more expensive than conventional food (Komorowska 2009). Large agricultural enterprises should also be involved in the production of pigs with traditional methods as they may supply large homogenous batches of animals for slaughter.

The aim of this study is a comparative analysis of the costs of production of intensively and extensively fed porkers in view of the qualitative parameters of meat obtained after slaughter.

Materials and methods

The production experiment, which involved the parallel fattening of 3 groups of 30 porkers (fed intensively up to a weight of about 120 kg and extensively up to weights of about 100 kg and 120 kg), was carried out between 2011 and 2012 in a deliberately selected farm.

The piglets, a crossbreed of Large Polish White and Polish White Lop-Eared breeds, came from our own breeding farm. The fattening started on 30 October 2011 when the animals' average weights were 43.1 kg (aged 78 days), 48.4 kg (aged 86 days) and 47.6 kg (aged 85 days) respectively. The feeds used for extensive fattening contained less total protein, energy and basic exogenous amino acids, such as lysine, methionine, cysteine, threonine and tryptophan, but they contained more raw fibre. Table 1 shows a detailed specification of the feeds. The feeding plan assumed the consumption of feed for piglets at 50 kg per head (intensively fed porkers) and 52 kg per head (extensively fed porkers). At the second part of the experiment, the animals received another total mixed ration. The porkers were fed from automatic feeders with a wet feeding system and were bred without bedding. The fattening took place in a separate farm building with mechanical ventilation to meet animal welfare requirements.

The animals were weighed once a month, which enabled the differentiation of four fattening periods: the first period from 30 October 2011 to 28 November 2011, the second period from 28 November 2011 to 27 December 2011, the third period from 27 December 2011 to 30 January 2012 and the fourth period from 30 January 2012 to 27 February 2012. The animals were sold every second week from 30 January 2012 to 27 February 2012. During the first sale, all porkers from the extensive group were sold, which were to reach the weight of about 100 kg, and several porkers from the other groups were sold, which exceeded the weight of 120 kg. On 13 February 2012 all the other porkers from the intensive group and several porkers from the third group were sold. The rest of the animals were sold on 27 February 2012.

The analysis of profitability of all three of the variants of pig production was made for the farm where the experiment was carried out, with full cost accounting. The farm specialised in the production of cereals and porkers. On average it had 140 sows and supplemented its own production of piglets with 1190 piglets purchased from another farm. During one year it sold 3836 porkers and the analysis of production profitability was made on that number of animals. The costs were calculated by their type (Fig. 1). The researchers assumed average prices of the means of production and prices of livestock pigs in individual meatiness classes noted in Poland in 2012.

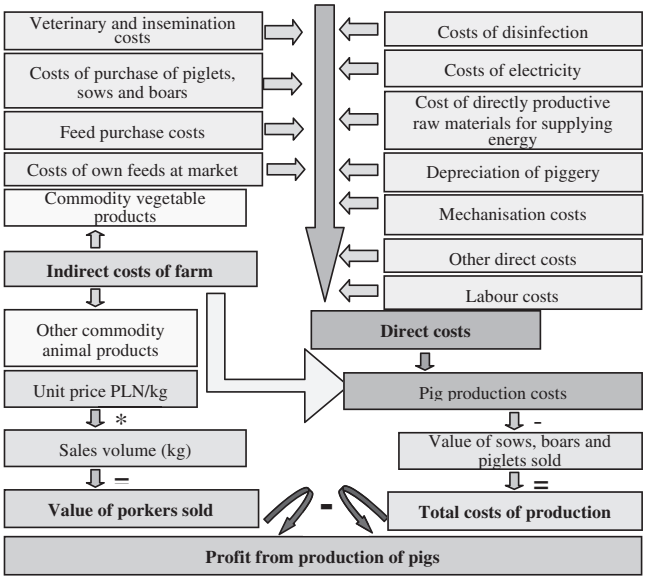

Figure 1. The methodology of calculation of profit from pig production Source: Pepliński B., Wajszczuk K., Wielicki W. Integracja pionowa a opłacalność produkcji żywca wieprzowego. Wyd. AR w Poznaniu 2004.

Table 1. The composition of feed used in the experiment

Specification		piglets		pigs	
		extensive feeding	intensive feeding	extensive feeding	intensive feeding
Total protein	%	16.5	17.5	15.0	15.5
Total protein range	%	16.0 – 18.0	16.0 – 19.0	14.0 – 16.5	15.0 – 17.0
Net energy	kcal	2163	2310	2163	2268
Metabolic energy	MJ/kg	12.4	13.2	12.4	12.9
Lysine	%	0.96	1.10	0.82	0.90
Digestible lysine	%	0.80	0.94	0.66	0.74
Methionine	%	0.32	0.34	0.25	0.28
Methionine+Cystine	%	0.65	0.69	0.66	0.61
Threonine	%	0.64	0.71	0.56	0.60
Tryptophan	%	0.19	0.21	0.17	0.18
Crude fibre (min-max)	%	4–7	3–6	4.5–7	4.5 –6.5
Ca	%	0.70	0.70	0.65	0.65
P total	%	0.60	0.60	0.65	0.60
Na	%	0.15	0.15	0.14	0.14
Vitamin A	IU	10 000	10 000	6000	7000
Vitamin D3	IU	2 000	2 000	1200	1400
Vitamin E	mg	40	120	30	120
Nutricine eq.		++	++	+	+

Source: Based on the data obtained from the feed producer

Research results

According to the assumptions of the experiment, the diversified composition of the feed resulted in different rates of growth among the porkers (Fig. 2). A higher content of protein and energy and a lower content of raw fibre contributed to faster increases in the weight of intensively fed animals. In spite of having the lowest starting weight (around 5 kg lower) on the starting day of the experiment, as early as the first check measurement the average weight of intensively fed animals was higher than the weight of extensively fed animals. The tendency could also be observed in the period that followed. The smallest difference in the growth rate took place during the second period when the intensively fed porkers were 2-3 kg heavier than the others. During the last period under investigation, i.e. between 30 January 2012 and 27 February 2012, the intensively fed porkers grew 7.48 kg heavier within two weeks of feeding, whereas the extensively fed porkers from the weight group up to 120 kg grew only 11.53 kg heavier within the entire period. However, it is necessary to remember that the porkers from the above-mentioned groups were sold gradually, so not all animals were sold during the last period of sale from a particular group (except for the group of extensively fed porkers up to 100 kg). The average weights were as follows: 126.1 kg for the intensively fed porkers, 109.45 kg for the extensively fed porkers up to 100 kg, and 121.83 kg for the extensively fed porkers up to 120 kg. The total average weight gains were 83.00 kg, 61.05 kg and 74.23 kg within 105 days, 93 days and 114 days, respectively.

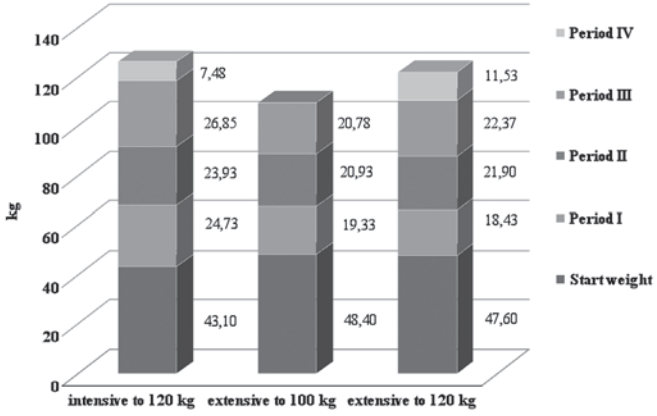

Figure 2. The dynamics of weight gain of pigs during the experiment. Source: Own investigation

The daily weight gain, which is shown in Figure 3, is a more reliable measure in the case under analysis. The porkers' weight gain was not steady either in time or in individual groups. The intensively fed porkers had the highest weight gains, i.e. 0.787 kg per day vs. only 0.657 and 0.645 kg per day for the extensively fed porkers. As the animals' body weight increased, the weight gain dropped. The intensively fed porkers showed the highest weight gain during the first period of fattening, i.e. 0.853 kg per day, whereas during the third month of fattening the weight gain dropped to 0.757 kg per day. During the last two weeks of fattening, when the slowest-growing animals were left, the weight gain dropped to 0.620 kg per day. As far as the extensively fed animals are concerned, the highest gains were noted in the second month of the experiment when the daily weight gains were 0.734–0.730 kg, as opposed to 0.667–0.636 kg in the first month of fattening and 0.584–0.638 kg in the third month of fattening. The porkers' slow weight gain in the first month may suggest that younger animals react more strongly to a poorer feed than older animals, which results in greater loss for producers during that feeding period.

The nutrients in the feed are used for the following purposes (Pepliński et al., 2004):

- animals' livelihood needs related to maintenance of vital functions, which depend on such factors as the temperature in the building, humidity and traffic intensity. During the experiment the animals were kept in the same building over the same period and in crates of similar size, meaning that the porkers were provided with similar conditions as regards their livelihood needs;
- productive needs, which are related with the body weight gain. These needs are relatively steady for a particular species and breed of animals, so the experiment met this requirement as well.

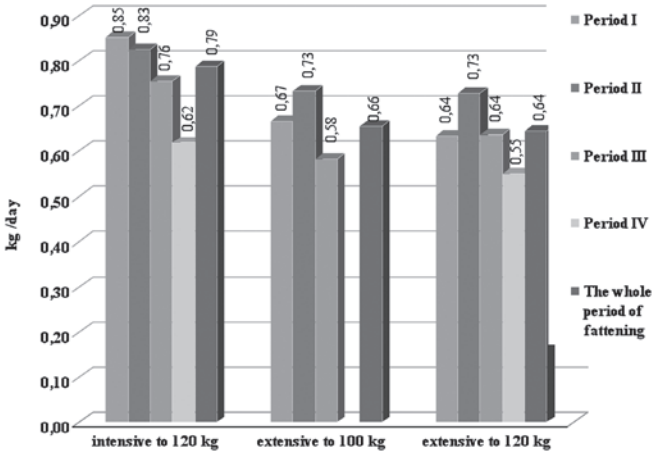

Figure 3. Pigs' daily weight gain during the experiment. Source: Own investigation

The lower gain weight influences most livelihood needs per gain unit, as the time necessary for the body weight to grow by the unit is extended.

Another element that increases the consumption of feed in the extensive feeding group is the lower amount of nutrients, necessitating a higher intake of feed to provide the same amount of protein, energy, and so on.

When analysing different groups of animals, the increasing consumption of feed must be noted per kilogram of weight gain as the porkers grow older and heavier.

In the experiment in question, the lowest consumption of feed was observed in intensively fed porkers (Fig. 4), where the average consumption was 3.06 kg of feed per kilogram of weight gain. The youngest animals consumed the least feed – 2.73 kg/kg, whereas the highest consumption could be ob-

served at the last stage of fattening, when it rose to 3.46 kg. As far as the extensively fed animals are concerned, at certain times their consumption of feed was higher; in the first month of the experiment it was about 5% higher, while in the following months of the experiment it was 8-10% higher than consumption by the intensively fed porkers. In consequence, the average consumption of feed in the group of extensively fed porkers up to 100 kg was 3.27 kg of feed per kilogram of weight gain, i.e. 6.8% more, whereas in the group of extensively fed porkers up to 120 kg, the consumption was 3.36 kg of feed per kilogram of weight gain, i.e. 9.8% more than in the intensive group.

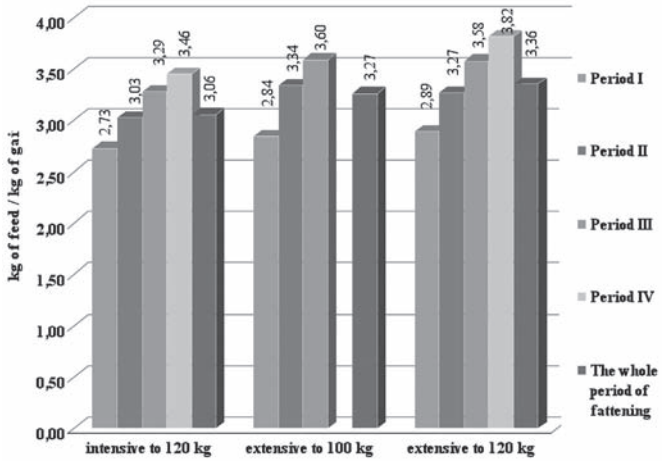

Figure 4. Feed consumption per kilogram of gain during the experimen
Source: Own investigation

From an economic point of view, the costs of feeds are the most significant, given that they can constitute as much as 60-75% of the total costs if cereals are priced very highly on the global market. In the groups of porkers under analysis, the costs of feed per kilogram of weight gain were less diversified than the consumption of feed (Fig. 5) and they fluctuated between 3.66 PLN per kilogram of weight gain in the group of extensively fed porkers up to 100 kg and 3.79 PLN/kg of weight gain in the group of extensively fed porkers up to 120 kg.

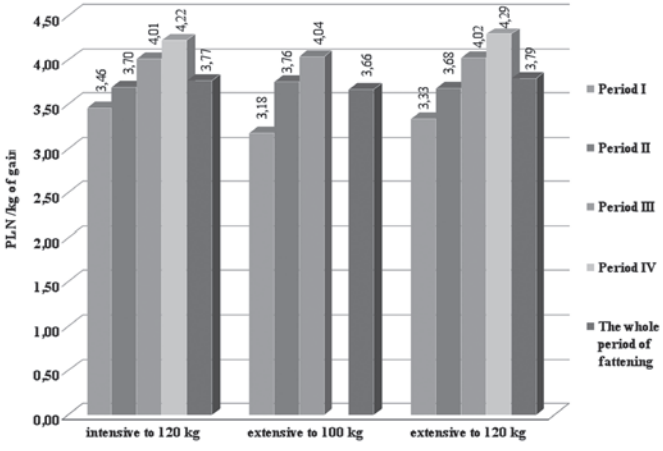

Figure 5. The cost of feed consumed per kilogram of gain during the experiment
Source: Own investigation

A slightly higher consumption of feed by extensive porkers in the first month of the experiment was compensated by the lower price of the feed, resulting in the cost of feed for both groups of porkers during that period reaching 0.13 and 0.28 PLN/kg of weight gain lower than in the intensive group. In the following months of fattening, a slightly higher growth of costs could be observed in the extensively fed porkers, so that in the third month of the experiment, the difference in costs amounted only to 0.03 PLN/kg of weight gain, and in the last month of the fattening, the costs of feed for the extensively fed porkers up to 120 kg were 0.07 PLN/kg higher than the costs of feed for the intensively fed porkers.

When the feeds consumed by sows and piglets used in the production were included in the starting weight in the experiment (about 45 kg), the lowest costs of feeds per kilogram of porkers sold turned out to be in the production up to 120 kg – both intensive and extensive groups. These were 4.15 PLN/kg and 4.16 PLN/kg, respectively, whereas the cost of feeds in the extensive production up to 100 kg was 4.38 PLN/kg (Fig. 6). This result is primarily related to the fact that the costs of feeds consumed by sows are divided into a smaller amount of kilograms in the porkers. Similar tendencies were observed in the other costs of production (Figures 6 and 7).

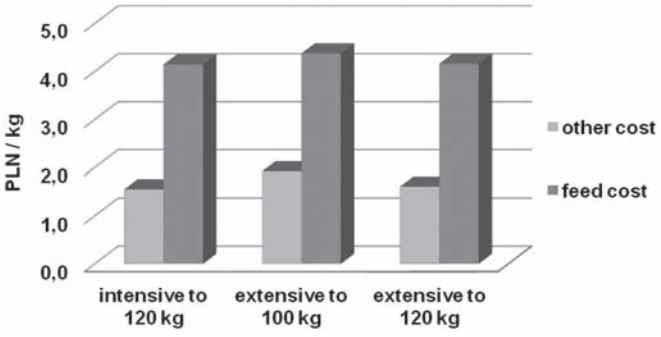

Figure 6. The costs of production of porkers in the farm under analysis in 2012
Source: Own investigation

Due to the fact that the farm supplemented its own production of piglets with external purchases, considerable costs arise for the purchase of piglets as part of the production costs. In view of the deficit of piglets on the market and record-high prices, the cost of purchasing piglets were high for the farm under analysis, and ranged from 0.53 PLN/kg in the intensively fattened group up to 120 kg, to 0.65 PLN/kg in the extensively fattened group up to 100 kg.

Labour costs are also very significant in the production of porkers. In the analysis, the authors assumed the costs of labour equal to the average pay in the national economy in Poland, i.e. 14.95 PLN/hour. The lowest costs of labour were 0.37 PLN/kg in the intensive production up to 120 kg and 0.38 PLN/kg in the extensive production up to 120 kg, and 0.46 PLN/kg in the extensive production up to 100 kg.

The costs of veterinary and insemination treatment fluctuated between 0.16 and 0.19 PLN/kg, depreciation costs between 0.12 and 0.15 PLN/kg, costs of mechanisation works between 0.11 and 0.13 PLN/kg, and electricity costs be-

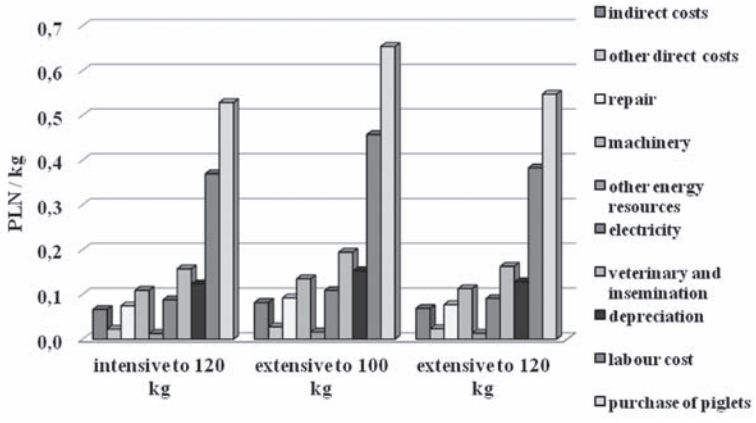

Figure 7. The costs of production of porkers (without feeds) in the farm under analysis in 2012
Source: Own investigation

tween 0.09 and 0.11 PLN/kg. Other costs did not exceed 0.10 PLN/kg.

The lowest total production cost, i.e. 5.70 PLN/kg, were found in the group of intensive production up to 120 kg, whereas the cost of extensive production up to 120 kg was 5.77 PLN/kg and the cost of extensive production up to 100 kg were as high as 6.30 PLN/kg. When the costs of production were corrected by the value of sows sold, the costs of production of porkers were 5.61 PLN/kg, 5.67 PLN/kg and 6.18 PLN/kg, respectively (Fig. 8).

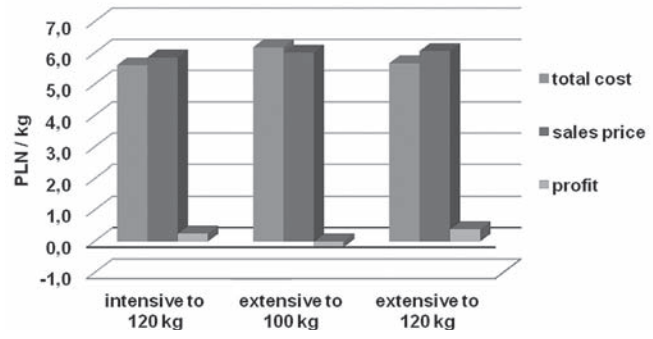

Figure 8. The costs of production,, the sales price and the profit from the production of porkers in the farm under analysis in 2012.
Source: Own investigation

As far as extensive fattening up to 100 kg is concerned, the average sales price in 2012 (6.01 PLN/kg) did not fully cover the costs of production, which resulted in a loss of 0.17 PLN/kg. The production was cost-effective only at the time when the prices were the highest, i.e. in September and October 2012 in Poland. As far as intensive fattening up to 120 kg is concerned, the profit was 0.25 PLN/kg, whereas the profit from extensive fattening up to 120 kg was 0.39 PLN/kg.

Extensive fattening up to 120 kg was, the most profitability chiefly resulted from the higher sales price (6.06 PLN/kg) rather than from intensive fattening up to 120 kg (5.86 PLN/kg. This was related to the fact that the porkers from this group achieved the highest average meatiness, i.e. 58.83%. Of 30 porkers that were sold, 11 were classified as class S, 1 as class U, and the other 18 as class E. The average meatiness of intensively fed porkers up to 120 kg was the lowest, i.e. 56.95%. Among the animals sold, 5 were in class S, 3 in class U, 2 in class R and the others in class E. The average price difference between meatiness classes in Poland is about 0.30 PLN/kg.

Tests of the meat quality proved that (depending on the place of measurement) the thickness of fatback in the porkers from the intensive fattening up to 120 kg was on average between 0.24 and 0.68 cm greater than in the carcases of the extensively fed porkers. 45 minutes after slaughter, the average pH values of both muscles under investigation were lower in the extensively fed porkers. However, the differences proved to be significant only in the SEM muscle ($P \leq 0.05$). In both groups of extensively fed porkers, the presence of PSE meat was found in about 10% of the carcases. On the other hand, DFD meat in the LD muscle was noted in 3.7% of the carcases of intensively fed pigs. In comparison with the intensive system in the LD muscle of extensively fed porkers up to 120 kg, there was a lower content of intramuscular fat and protein (by 0.44% and 0.71% respectively). The muscles of intensively fed porkers were slightly darker L* 46.28 in the group of intensively fed porkers, as opposed to 47.45 and 48.17 in the groups of extensively fed porkers up to 100 kg and 120 kg, respectively. Furthermore, in comparison with the carcases of the intensively fed porkers up to 120 kg, the meat from the carcases of the extensively fed porkers up to 100 kg and 120 kg exhibited worst water absorption (32.08% vs. 34.39 and 32.93% respectively) and higher natural exudate from the raw tissue (by 0.98% in the intensive group and 0.78% in the extensive groups) and from thermally processed tissue (by 3.72% in the intensive group and 3.46% in the extensive groups).

The smell, juiciness, tenderness and tastiness of the muscles of the porkers of both feeding systems received an average mark of higher than 4 points. The tenderness and tastiness were better in extensively fed porkers. On the other hand, the results of shearometric measurements of the muscles of the groups under investigation were similar (shear force from 27.14 to 28.33 N/cm^2).

Conclusions

1. The use of feeds with a smaller content of protein, energy and exogenous amino acids but with a higher content of fibre in feeding extends the fattening time, reduces porkers' daily body weight gain and increases the consumption of feed per kilogram of weight gain.
2. In the experiment, the costs of feed per kilogram of weight gain were similar in the groups of intensively and extensively fed porkers up to 120 kg, which suggests that the lower price of the feed fully compensated for the lower weight gains.
3. Reduced fattening time causes reduced average costs of production of porkers, due primarily to the higher weight of porkers sold, where fixed costs such as the cost of rearing piglets, depreciation costs, and so on are included.

4. The extensively fed animals up to 120 kg were the most profitable, because they had the highest meatiness.
5. The experiment shows that increased intensity of fattening is not economically justified in local Polish cross-breeds of pigs.
6. Tests of the quality of meat from extensively fed pigs showed that its qualitative parameters were more often worse than those of the meat from intensively fed pigs.

Acknowledgement

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INNOVATIVE TRAINING METHODS IN BUSINESS HIGHER EDUCATION

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Abstract: A unique business-oriented educational method was launched in 2010 at the University Of Debrecen, Hungary, in the Faculty Of Applied Economics and Rural Development; the method has existed in the JAMK University of Applied Science in Jyväskylä (Finland) since 1993, and is called Team Academy. The gist of this training is that the students learn entrepreneurship through their 'living' organisations with the application of the principle 'learning-by-doing'. Besides developing the students' entrepreneurial competencies and skills, this educational model also offers team coaching tools to develop teams of 12-13 students that can cooperate in an efficient way. The key point of Team Academy, which has been launched in several European higher education institutes over the past years (e.g. Spain, France, the Netherlands, etc.), is that the most efficient way of learning how to operate a successful company is to learn it in practice.
During the professional and project trainings, the cooperation of the team and their company's efficiency is continuously developing with the help of team coaches. A quite wide variety of team coaching tools is used in this system, e.g. 360◦ evaluation, which is a very important tool of human resource management. Feedback from students also plays an important role in developing team cooperation; the professional frame for this is also given by the above-mentioned methodology. This method is used successfully at the Debrecen Team Academy which / and (do you mean that the a) Team Academy or b) the above-mentioned methodology will be presented? If B), then write 'and' instead of 'which') will be presented in this study. A database of 150 questionnaires is analysed through qualitative research methods.

Key words: higher education, entrepreneurship development, learning by doing

Motto

Tell me and I will forget; show me and I will learn;
let me do it and I will understand it!

(Confucius)

An introduction to the Team Academy model

The basic principle and gist of Tiimiakatemia (Team Academy), which has proved to be a very efficient learning method and was introduced in 1993 in Jyväskylä (Finland), involves experiential learning, the application of 'learning by doing'. This well-recognised method combines higher education and the business world and has received several Finnish professional awards as well as the OECD award in 2006 because of its novelty. All teams operate as independent cooperative companies. Students have to do real-life projects, which they have to find themselves, to cover all the expenses of the company. Projects function both as learning environments (for studies and developing the individual's competence) and as ways of doing business (for team companies). Learning is a process that is not divided into modules or subjects like marketing or leadership. Tiimiakatemia has no legal control over its team companies; it only provides the coaching for the learning process. The main methods are learning by doing and team learning. Projects offer opportunities to apply studied theory directly to practice and also provide a platform for students to reflect on theory in light of their own experiences while studying. Teams use dialogue as a tool to share knowledge and think together. The purpose of dialogue is to go beyond one individual's understanding – the whole organises the parts, rather than trying to pull the parts into a whole. In dialogue, people become observers of their own thinking. Team Academy is a "flat organisation"; thus, instead of involving a hierarchy, the management is done by using leading thoughts. Thus, it is the coaches' and leaders' main function to continuously remind everybody of these values. (I1)

Each Team Academy student takes intensive training in leadership, entrepreneurship and marketing as a member of a team through real life project work. The Team Academy is open for business students but based on its experiences, a set of courses promoting entrepreneurship has been developed for all students, entitled "the path for nascent entrepreneurs" (OECD, 2011).

At the University of Debrecen's Faculty of Applied Economics and Rural Development, Team Academy started operation in 2010. Students of Finance and Accounting, Commerce and Marketing, and Tourism and Catering BSc programmes partook in this training from their 5th semester onwards.

The core idea of the training is based on the principle of 'learning by doing'; the students found a limited liability company just like in Finland and work in small groups on several projects. Each teampreneur's academic studies are approximately 3,5 years long in total. Each team organises its activities as a real-life team company that is owned entirely by the teampreneurs and is totally independent from Team Academy as a juridical entity.

The learning path involves doing three things (Partanen, 2012):

Training sessions: Teampreneurs participate in team coaching sessions twice a week for four hours at a time with their team. These are called "training sessions", and use a learning organisation practice called "dialogue", facilitated by a team-coach who uses questions to steer the dialogue. Sometimes team members might organise brainstorming sessions to solve difficult problems or hold presentations and lectures for each other on theoretical subjects.

Projects: the project is the learning process where the rubber meets the road. Teampreneurs carry out projects **to the business life** using their team company as a vehicle to get them done. They are responsible themselves for finding clients, negotiating with them on the projects, signing contracts and doing the jobs they have promised to do.

Theory programme: Learning by doing and training sessions are supported with a theory programme. This consists of reading 50-60 management books that are chosen from The Book of Books – a catalogue that has approximately 1000 book recommendations to choose from. For each book, the teampreneur writes a reflective essay on it. The key idea of the theory programme is to support "applying theory to practice" and vice versa.

Concrete tools, methods and concepts in Team Academy:

- Team coaching
- Before and after Action Reviews (Pre- and Post-Motorolas)
- Internal community meeting days (Houston calling)
- Network days and forums (seminars and conferences)
- Individual's competency assessment (Skill profile)
- Team quality assessment (Quality 47)
- Leading thoughts (vision, mission, values, principles, etc.)
- Internal leadership program
- Rules of dialogues
- Brand envelope
- HIT MR Leadership philosophy
- Leadership positions within Team Academy
- Competency demonstrations (Birth Givings)
- Around-the-World Trip (concrete goal of team, TA Jyvaskyla)
- Individual's development discussions

In this paper, we would like to present the method of 360 degree evaluation, a tool for assessing an individual's competency, which is a special method in Team Academy as well as being an applied method in the business world.

360 degree evaluation in the model of Team Academy

In the Skill Profile, the term "skill" refers to extensive competences. It is a consciously chosen term, because the concept of competence sounds slightly artificial. Skill, on the other hand, is a genuine and basic word referring to mastery. The word "skill" in the Skill Profile contains the "five fingers" of the "learning hand" defined in the EU: (1) knowledge, (2) skills, (3) experiences, (4) contacts and (5) attitudes.

The Skill Profile consists of 21 skills that are important for Teampreneurs, divided into three categories: (1) team learner, (2) team leader and (3) teampreneur.

(1) Team learner: Information processing and IT-skills, Team learning skills, Personal skills and attitudes towards learning to learn, Creativity skills, Internationality skills, Communication skills, Initiative
(2) Team leader: Self-leadership skills, Project leading skills, Team leadership skills, Planning skills, Coaching skills, Strategic skills, Courage to make choices and Goal-orientation
(3) Team entrepreneur: Service, Negotiation and selling skills, Understanding of financial issues, Marketing skills, Innovation skills, Entrepreneur's modelling and theory skills, Networking skills, Courage and desire to break boundaries

Each skill is given a score according to the skill level:

Table 1. Scoring of the Skill Profile

Points	Level	General description
0	No know-how	Has no command at all of the skill, no knowledge or experience in the area.
1	Beginner	Understands the basics of the skill area, but has little practical experience (a few experiments).
2	Advanced beginner	Understands the theoretical background and also has a little more profound knowledge. Has some experience in using the skill (has completed a project in which the skill area has been practised significantly).
3	Practised	Has profound knowledge of the skill area and experience in using the skill (2-3 projects in which the skill area has been practised and/or has had a leadership position in the skill area).
4	Experienced	Has profound, diverse knowledge of the skill area, and has significant experience in using the skill (several projects and/or leadership positions).
5	Expert	Has extremely strong mastery of the skill area in both theory and practice. Is capable of working as an initiating expert in the area.

Source: Partanen, 2012

The scoring of skills is a way of understanding your own know-how. However, the numbers do not tell the whole truth – many important things are beyond their scope.

Roadmap for using the Skill Profile

1. Personal evaluation of skills
2. Asking for feedback from team members, coaches and customers about personal skills
3. 360° evaluation. The more people give to the teampreneur feedback, the better.
4. Reflection phase. Examine the evaluation through conversations in the team company. The idea is to acquire development tips to improve skills. When Skill Profile has been discussed, the teampreneur can set new objectives; the Learning Contract is the best tool for this.

In the model of Team Academy, this 360 degree evaluation starts with a quite strict (strict in what way??) self-assessment, after which the team members, coach and customers also add their point of views. The team then discusses the results in the form of dialogue, focussed on each teampreneur's improvement. The new goals which arise will be set in the Learning Contract of the teampreneurs.

360 degree evaluation in the business world

360 degree evaluation as used at the University of Debrecen's Team Academy is quite similar to the one used by HR professionally in the business world used for the evaluation of managers. After self-evaluation, the individual is analysed from all "angles" (i.e. 360 degrees). After this self-evaluation, the individual is evaluated by his/her supervisor(s), colleagues and staff. The tests are anonymous, so the colleagues can give their honest opinion on the individual and his/her work. Its application happens in different ways, such as with a pre-prepared evaluation paper, orally or in writing. The evaluated individual evaluates him- or herself using the same questionnaire as the colleagues, thus making more objective.

To supplement the methodology of Team Academy we applied this 360 degree evaluation in the Autumn semester of 2012. We focused on the fields shown in Table 2 and asked questions from a pre-prepared questionnaire. The results of both the teampreneurs' self-evaluation and the other team members' evaluations were discussed at a special training **in dialogues of the teampreneurs and coaches**.

Field of the questionnaire on 360 degree evaluation

Application of professional knowledge: *The individual bears the knowledge and skills needed for his/her position, can apply them properly and in a creative way in his/her work, and can share his/her knowledge in an efficient way and improve it continuously.*

Communication, relationship management: *The individual's behaviour and communication is trustworthy, plain, flat (??? sounds negative) and persuasive. He/she considers his/her partner's signs and applies the tools of informatics in a creative way. He/she is able to make contacts and to maintain it to represent the company. He/she is able to manage conflicts properly.*

Reliability, taking responsibilities: *The individual knows and observes the regulations for his/her position. He/she can apply the regulations in a trustworthy manner and can judge the acceptable differences. He/she proposes a correction if it is needed. He/she weighs up his/her judgements and arrangements. He/she fulfils tasks with responsibility, independently and precisely. He/she undertakes decisions, recognises mistakes and corrects these on his/her own.*

Cooperation: *The individual can cooperate with different partners efficiently. He/she is able to form team norms and to keep him/herself and other teampreneurs to them as well. He/she acts according to the roles in the team. He/she is able to follow team goals and/or to take part in their forming. He/she manages the rate of trust and request correctly.*

Management of complexity: *The individual is able to think, decide and act in a complex way in routine and open situations. He/she applies the tools of cause and effect analysis and problem solving, and can set and/or accept goals. He/she plans his/her activity, carries it out according to the plans, analyses, evaluates the results and makes/suggests corrections if needed. During decision-making, he/she considers the spheres of action and tasks.*

The evaluations of these characteristics are evaluated on a 6 degree scale, where the values mean the following:

(1) poor
(2) sufficient
(3) less than average
(4) better than average
(5) good
(6) excellent

The questionnaire was filled in by teampreneurs for themselves and for other students in written form.

During the dialogue the teampreneurs reviewed their self-evaluations based on the most important competences; after that, they listened to the feedback of the other teampreneurs and coaches.

Each teampreneur received his/her evaluation in the form of a diagram (Appendix 1) and a questionnaire (Appendix 2) that showed the comparison of their self-evaluation and the other students' opinions. Through this diagram, they could see more clearly which fields are to be improved based on their own opinion and on that of the other team members.

After this evaluation, the teampreneurs continued their work taking into consideration the 'criticism' they had received through the 360 degree evaluation, focusing more on the fields to be improved. This 360 degree complex evaluation is done every year in the teams with the help of their coaches.

Summary

Performance evaluation is a key factor in human resource management. One of the most important goals of its application is to enhance the individual's performance and to evolve their skills as much as possible. 360 degree evaluation ensures a communication path between the individuals at a company, through which they can express what they expect or wish from one another. The application of this method is quite novel in business higher education, as is the methodology of Team Academy. However, based on the Finnish experience, its efficiency is incomparable. Nowadays, the need for self-employment and entrepreneurial activity is increasingly apparent in Hungary, and the application of the Team Academy methods and continuous, fully comprehensive performance evaluation is of prime importance in helping to fulfil this need.

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MAKING AGRICULTURAL SUPPORT OBJECTIVE-ORIENTED: A LINEAR PROGRAMMING APPROACH FOR UKRAINE

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Abstract: The overall aim of the paper is to analyse the distribution of state agricultural support in Ukraine with the purpose of drawing up proposals on how to make it more objective-oriented. The investigation is based on the results of a case study conducted in Zdolbuniv district[3], in the Rivne region of Ukraine, where interviews with local agricultural experts were held. The research is founded on the Linear Programming (LP) methodological approach, which is applied to calculate an objective-oriented agricultural budget allocation. This approach also integrates judgements from district agricultural experts. The outcomes show that agricultural support should have been redistributed in a slightly different way from the district perspective. However, the calculated changes in most cases match with the overall development directions in the Ukrainian agricultural support policy. Furthermore, the developed model has proved to be a useful and, at the same time, quite simple tool in application support, and one which could have been used by the agricultural decision-makers in the process of the distribution of agricultural support.

Key words: *Agricultural support, Linear Programming, Ukraine*

1. Introduction

The usefulness, means and scale of state agricultural support have been already discussed many times by scholars from both developed and developing countries. A lot of scientific attention is paid to this field because of the unique particularities of agriculture and its important role in the food security of a state and the life of a society (Dibrova, 2009). In the European Union (EU) the "evolution" of the Common Agricultural Policy (CAP) has eventually led to a shift from production support to rural development support and the enhancement of agri-environmental measures (EC, 2010).

The state agrarian policy of the Ukraine considers the necessity of the country's integration into the EU (VRU, 2005a, article 1). As a result, the Ukraine has also proclaimed social and economic developments of rural settlements as one of its main priorities in agrarian policy . However, despite this fact, a large part of its agricultural budget is still spent on agricultural production support (VRU 2007, 2008 and 2010). Also, in the current conditions of restricted budgetary resources, it is especially important to rationalise agrarian policy, optimise the financial support of agriculture and enhance the efficiency of budget expanses expenses (Bojda, 2006).

As from 1991, the allocation of agricultural budget has been carried out by the Verkhovna Rada of Ukraine (VRU) and the Ministry of Agrarian Policy of Ukraine (MAPU). The overall objective pursued in the agrarian policy is to improve the social economic conditions of 3.5 million peasants engaged in agriculture and 14.7 million citizens living in rural areas (MAPU 2008a and 2008b). However, the experts of the district state administration (DSA) agricultural departments, who know all the social economic particularities of specific areas and work directly with the farmers and agricultural entrepreneurs, are not in any way integrated in the decision-making process concerning agricultural funds distribution. The question arises as to how possible suggestions and propositions could be made at the district level if the criteria on how these funds should be allocated either do not exist

[3]Administratively, Ukraine is divided into 25 regions which are further divided into several districts each. The number of districts differs from region to region and depends on the region's size in terms of of production, population, etc. (Administrative units, by region, available at http://www.ukrstat.gov.ua/).

or are not known to the public, including regional level state authorities. Which instruments, models and methods could have been employed to provide support for the agricultural decision-makers in charge on the district level?

The research is guided by two particular objectives: (1) to analyse the recent distributions of agricultural budgets in Ukraine, and (2) to develop a model for calculating an "optimal" agricultural budget allocation based on the judgements of district agricultural experts – judgements that are realistic, objective and independent from personal preferences.

The first objective is reached by making a thorough review of existing official documents related to agricultural support and analysing relevant scientific papers. The methodological approach that is used to reach the second objective comprises the development of a model based on the Linear Programming (LP) approach. The judgements of official agricultural representatives received during the interviews in the case study Zdolbuniv district are further integrated in the model.

2. Agricultural budgeting in Ukraine

The experience of 2010 has shown that Ukraine remains quite unpredictable in the sphere of budgetary planning. The country has gone through almost a third of the year without the main financial document which is the budget. This meant a sum total of zero Ukrainian Hryvnia (UAH) for agricultural support from January till April 2010. When the budget was finally adopted on the 27th of April 2010 (VRU, 2010) it was comparable to those of previous years.

The agricultural share in the whole budget slowly increased for some time over recent years, going from 3.5% in 2004 to 6.4% in 2008 (fig. 1). Based on this tendency, predictions had been made that agricultural issues were of growing concern to state political leaders and that more financial resources would be "invested" by the state into the agricultural sector[1]. However, the agricultural share then became twice as small (3.2%) in 2009 as in the previous year. In 2010 its share in the whole budget reduced even more, comprising only 2.2%.

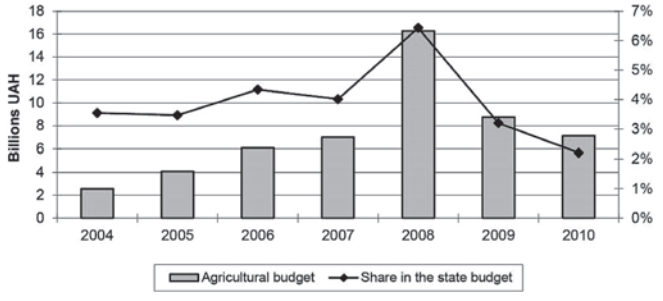

Figure 1. Share of agricultural budget in the state budget of Ukraine, 2004 to 2010. Source: Own compilation based on data from laws on state budgets

3. The agricultural sector in the research district

Zdolbuniv district is an administrative part of the Rivne region, situated in the north-western part of Ukraine. The contribution of the agricultural sector to the Zdolbuniv district's GDP had been changing between 2006 and 2008. It comprised the largest share, at 21%, in 2005 and the lowest of 12% in 2008 (Drozd, 2009). However, this share had always been larger during the mentioned period than the average one in Ukraine. Therefore, it might be concluded that the agricultural sector plays quite an important role in the economics of Zdolbuniv district.

The employment opportunities within the agricultural enterprises of Zdolbuniv district declined between 2006 and 2008 (Drozd, 2009). Furthermore, the average salary of the workers engaged in agricultural production was also less than that in other spheres of activities during the same period. While the job opportunities are decreasing and agricultural income is at its lowest, the size of agricultural budget in Zdolbuniv district in 2009 sharply diminished by almost four times when compared to the previous year (Drozd, 2009).

At the same time, the volume of agricultural production does not fluctuate so quickly. Therefore, it is very important for the agricultural producers and state agricultural representatives in Zdolbuniv district to be able to adjust to such changes. For these reasons it was proposed to investigate the possible scientific "inventions" which could offer support in finding the "optimum" allocation of agricultural funds in Zdolbuniv district under such conditions.

4. Linear programming approach

The application of a linear programming approach with the purpose of deciding which agricultural policy measures should be financed to meet the particular objectives in the best possible way was introduced by Jechlitschka, Kirschke and Schwarz (2007). They also describe how to implement this method in MS-Excel.

The objective function can be defined as follows (Kirschke et al., 2007, p.3):

$$Z_1 = \sum_{i=1}^{n} z_{1i} \cdot B_i$$

with:

Z_1	1st objective
B_1	budgetary expenses for a measure i
i = 1, …, n	index of the respective measure considered
z_{1i}	constant marginal and average coefficient of

the objective function describing the impact of the budgetary expanses for measure i on the 1st objective.

In fact, policies measures are often implemented to meet several objectives (VRU, 2005). If there are, for example,

[1]This statement is based on the opinions of the agricultural department's experts in Zdolbuniv district.

two objectives determined, an aggregated objective function can be defined by putting together both objectives' functions, giving weights:

$$Z = (1-\alpha)Z_1 + \alpha Z_2$$

with $(1-\alpha)$ and α being weighting factors.

The weighting factors $(1-\alpha)$ and α represent the contribution of the objectives Z_1 and Z_2 in the objective function Z. If more objectives have to be included in the decision-making process, it is recommended to consider them as restrictions in order to avoid possible difficulties (Kirschke et al., 2007).

Finally, the described optimisation approach may be formulated as follows (Kirschke et al. 2007, p.4):

$$Z = (1-\alpha)\cdot\sum_{i=1}^{n} z_{1i}B_i + \alpha\cdot\sum_{i=1}^{n} z_{2i}B_i$$

subject to: $\sum_{i=1}^{n}\alpha_{ri}B\begin{Bmatrix}\leq\\=\\\geq\end{Bmatrix}b_r$ for r = 1, …, m and $B_i \geq 0$ for i = 1, …, n

where:

r = 1, …, m is the index of restrictions (equations or inequations)
a_{ri} is the coefficient of restriction r for measure i
b_r is the right hand side of restriction r.

5. Generation of input parameters

5.1. Measures considered

The input parameters were generated as the result of overview of agricultural normative documents in Ukraine and the discussion with the district agricultural experts (just experts in the following) about the actual situation in Zdolbuniv district. This list, which is presented in table 1, consists of eleven measures.

Table 1. Measures considered in the model

M1	Breeding in animal and poultry production on the enterprises of agricultural sector.
M2	Budgetary state subsidies for the support of animal and plant production.
M3	Breeding in plant production.
M4	Financial support of agricultural enterprises through the mechanism of subsidising through credits from commercial banks.
M5	Creating reserve stocks of hybrid high-quality seeds.
M6	Planting and looking after young orchards.
M7	Reimbursement of the cost of domestically produced agricultural equipment.
M8	Financial support of farm enterprises.
M9	Farm enterprises crediting.
M10	State support of hop growing development.
M11	Partial recovery of insurance costs.

5.2 Selection of objectives

The criteria defined for the evaluation of state agrarian policy efficiency in the Law of Ukraine "On the Main Principles of State Agrarian Policy for the Period until 2015" (VRU 2005) were proposed to be used as objectives for the impact assessment of the above-mentioned measures.

During the discussion of these objectives with experts, all of them appraise the objectives of (1) *Creating job opportunities* and (2) *Increasing income* as being relevant for the evaluation of the effectiveness of agrarian policy. The choice of these objectives is also validated by the decrease of employment opportunities in the Zdolbuniv agricultural sector and the low income level in the agricultural sphere (Drozd, 2009). Furthermore, these two objectives are also included in the district agricultural development program as priority targets and the experts had no difficulties with the assessment of the measures' contribution to the achievement of these objectives.

5.3 Impact assessment

After agreeing on measures and objectives it is necessary to evaluate the impact of these measures with regard to the defined objectives. The six experts from the agricultural department of Zdolbuniv DSA were asked during individual interviews to make judgements based on one-dimensional 1-9 scale. Such a simple scale is argued by Jechlitschka et al. (2007, p. 201) to be an appropriate for the generation of coefficients of the objective function. Coefficients 1, 2 and 3 would indicate a small contribution of a measure to an objective, while coefficients 4, 5 and 6 signify a medium contribution, and coefficients 7, 8 and 9 a high one.

Figure 6 depicts the geometric means of the measure-specific impact parameters with regard to objectives one and two. Two tendencies can be summarised from figure 2. First, the impact parameters of each particular measure with regard to both objectives do not differ significantly. Second, in most cases the experts assigned higher contribution estimates for objective one (creating job opportunities). Such judgements might be partly explained by the opinions expressed by the experts during the interviews that "both objectives are interrelated" and "it is more likely that new jobs will be created than income will increase".

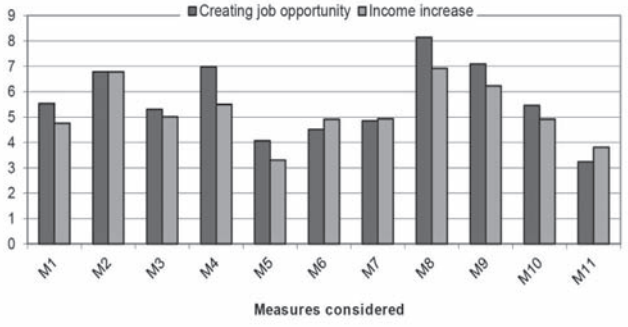

Figure 2. Impact parameters (geometric means) for objectives one and two. Source: Own compilation. (I would write job opportunities as the title for the blue bars)

5.4 Constraints incorporated

Based on the discussion with the experts, it was concluded that the model is only restricted by upper and lower bounds and the amount of budget available. According to Ukrainian legislation, there are no comprehended interrelations between the amounts of measures financed. Everything is financed only from the national budget through regional and district administrations to the final "consumers".

Therefore, it was agreed to stay with "realistic"[1] 20% of upper bounds (UB), while lower bounds (LB) change for each measure considered. For the three measures which were not actually financed during 2008 but are incorporated into the model, it was decided to set the UB at the level of the regional average for the specific measure and the LB at zero. Also, the second constraint is that the district agricultural budget has to be spent completely, but the whole amount of money defined for the district in the particular year cannot be changed.

6 Model definition and exploration of its potential for optimisation

The agricultural budget of the Zdolbuniv district constituted 6.05 million UAH in 2008. This money was distributed between eight measures, all of which belong to the "Support of agricultural enterprises" group according to the national legislation (VRU, 2007).

Figure 7 depicts the differences between the optimal and reference allocation of Zdolbuniv agricultural budget. The three measures M3, M5 and M11, which were financed on the regional level but not on the district one, do not appear in the optimal allocation either. In this case, the experts' evaluation matches with the actual distribution. However, the remaining eight measures should have been supported differently from the experts' perspective. The financing of two of them (M2 and M8) should be increased, while the financing of the other six should be diminished.

The production subsidy measure (M2), which comprised the largest part (74%) of Zdolbuniv's agricultural budget by far in 2008, is still enhanced by 6% in the computed optimum. This is despite the fact that this measure belongs to the "yellow box" group. At the same time, the second measure (M8), which has also a positive difference comparing to the reference situation, is focused on investment support of farm enterprises and is a "green" measure. However, it constituted only 2% of the reference budget. Further, it should be noticed that the amounts of the second and third largest financed measures (9% and 6% of the budget respectively) on supporting hop growing development and the reimbursement of the costs of domestically produced agricultural equipment (M10 and M7) should be decreased according to the district perspective. Also, the second chart of figure 7 shows that the upper and lower bounds are binding for all measures except one (M2).

As a result of the programming application, the overall value of the aggregated objective function increases from 38663.3 to 39130.9. Such an increase of 1.1% shows that the optimisation potential is not large. The hypothesis was made that the model optimisation potential is mainly restricted by the 20% upper and lower bounds which were used. It was therefore decided to test the optimisation potential under less restricted upper and lower bounds borders. After increasing the UB from 20% to 100%, setting the LB at zero and testing the model, the aggregated objective function increases by 5.2% compared to the reference situation. Hence, in order to obtain a larger value of the objective function, greater "fluctuations" within the agricultural budget should be allowed by the regional state agricultural department.

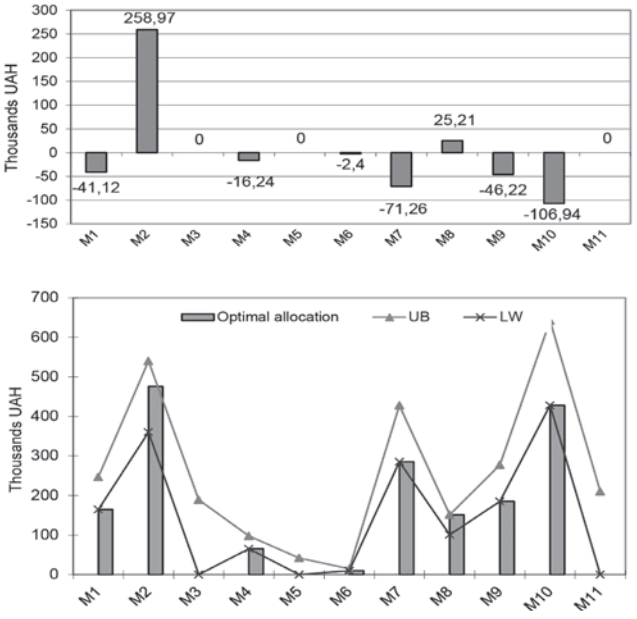

Figure 3. Allocation changes with respect to the reference situation*. Source: Own compilation and calculations.

* The real amount of measure 2 is divided by 10 in the second chart of figure 3.

Since the agricultural budget amounts have been seriously fluctuating during recent years (fig. 1), it was decided to test the model optimisation potential also in the conditions of low agricultural support. In 2009, Zdolbuniv's agricultural budget comprised only 1.6 million UAH, which was almost four times less then in the previous year. Based on the same experts' judgements, the aggregated objective function increased from 19833.8 to 21892.6 (a growth of 10.4%), comparing the optimal to the reference situation, after the application of programming to the 2009 case. Therefore, under conditions of scarce budgetary resources, the optimisation potential of the model is even enhanced.

[1] *De jure* the upper bound for the district by each financed measure is limited by two amounts: the size of all regional money planned for this measure in the following year and the overall size of district agricultural budget. However, *de facto* the experts' experience shows that it is realistic to change the received distribution in the frame of about 20%.

7. Conclusions and Outlook

There are various measures and programs with the help of which the state is able to support agriculture. However, not all of them suit the specific agricultural features of each country. Therefore, the relevant ones need to be thoroughly chosen for implementation in each specific case in order to fulfil the set agricultural objectives and receive the maximum benefit from the use of state monetary resources. Furthermore, before deciding on relevant measures, it is important that the relevant objectives of the agricultural policy have been formulated. The undertaken agrarian policy has to correspond both to the domestic needs and international obligations of the country.

With respect to the first objective concerning agricultural budgeting in Ukraine, the following statements can be summarised. First of all, the agricultural budget is very "unpredictable" in that the amounts of both the whole budget and specific measures financed might change every year. The mechanism of deciding on the measures that are going to be financed in the next year is not transparent. A number of support programmes might also change every year and the agricultural producers are not informed about such alternations in advance. Local state agricultural officials are not engaged in the process of agricultural budget formation and neither are they familiar with the principles and purposes by which the distribution of agricultural support is decided.

According to the second objective of this paper, a model for calculating an "optimal" agricultural budget allocation was developed. The proposed modelling approach enables us to integrate the opinions of local agricultural experts in the decision-making process concerning agricultural funds distribution. This model is recommended for use with the purpose of supporting the agricultural decision-makers in their initiatives to make agricultural budget distribution more objective-oriented, at least on the district level. Although the results from the modelling approach which was used depend heavily on the experts' individual attitudes towards the necessary changes in the development of agricultural support, the modelling outcomes do show how the agricultural budget should be redistributed to achieve the optimum. It also proves that the set agricultural objectives are highly interrelated. Furthermore, the proposed approach demonstrates larger potential for optimisation in the conditions of scarce financial resources which is the actual situation in the sphere of agricultural support in Ukraine.

The results of the present research work raise a range of questions which remain to be thoroughly examined in the future. First, the agricultural policy framework need to be further analysed in order to develop proposals on specific objectives for the separate measures or group of related measures. These objectives need to be relevant, accurate and valid. Second, the LP approach could be used in order to model the distribution of agricultural funds on a regional level. At the regional agricultural department level, many decisions are made concerning the distribution of agricultural monetary resources. Therefore, the modelling of regional agricultural budget allocation might facilitate the officials in finding out its "optimum" distribution.

Thus, the results of this paper contribute to the scientific field focused on analysing the possibilities of making agricultural support more objective-oriented and highlight the related issues which need to be further investigated in the future.

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THE PROBLEMS OF REGIONAL DEVELOPMENT IN MONTENEGRO

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Introduction: Economic development is a continuous, stochastic process considering that development depends on a multitude of historical, political, economic, cultural, ethnic and other factors. In the process of development, each country puts effort into strengthening their manufacturing potential, increasing the competitiveness of their economy by modernizing technology, and raising the level of education, culture etc. Owing to the accentuated actions of these factors, and different social, economic and other circumstances, there has been emerging polarizations in regional development, urbanization and so on. Proof of a country's level of economic development can be found in various indicators such as capital equipment; the share of manufacturing, agriculture, and foreign trade; the share of the private sector in total ownership; the development of financial institutions and capital markets; the development and stability of the legal system; the development of transport, telecommunication and other infrastructure; the realized standard of living; the development of democracy and human rights protection; preserved environment etc. Economies of developing countries, including Montenegro, are usually characterized by a low capital equipment and low labor productivity, expensive manufacturing and insufficient share of world trade, high import dependence, uncompetitiveness, high unemployment, undeveloped entrepreneurship, and an undeveloped financial institutions. Polarized countries in an economic and development sense, are therefore those which are unevenly developed, and are constantly faced with highly pronounced problems of disparity in regional development and demographic problems. Solving these problems is a long-term process and necessitates. The design of a regional policy that is more efficient than the previous ones, as well, as building a different procedure for fulfilling the adopted regional policies.

Key words: sustainable development, regional inequalities, rural areas

1. Solving inherited economic disparities

Regional development problems need to be addressed and solved as a part of a larger context. The present global community causes interdependent economies to continually strengthen their economic integration. The European Union puts a lot of effort into overcoming structural disproportions among the member states. On one hand, the EU strives to strengthen the functioning of the market economy, but, on the other hand, using a devised regional policy, it conducts structural adjustments over the single market for the purpose of overcoming regional disparities, equalizing development and establishing special and social-economic cohesion of the area. This will facilitate the flow of capital and goods, the flow of labor force, ideas, technology etc. Theoretically, such a united area can easily withstand possible shocks from the global markets.

The regional policy of the EU is ever more active and demanding. By co-financing projects and supporting public-private partnership, the EU forces economic development and the overcoming of the inherited economic disparities.

Regions of Europe are a model of harmonizing differences. All the member states contribute to this through: programs for the following: entrepreneurship and innovations; support for IT and communications; sustainable energy; strengthening European cooperation in education for the sake of building a wide European education area; supporting research, etc.

The regions are increasingly becoming territorial and economic entities for accomplishing uniform regional development. They need to have a greater role in solving key problems of development. For the citizens, it is in their own interest to participate in those processes, to encourage development, to be protected. The more developed the regions, the more likely they are to solve new issues of economic and demographic regions, land planning, transport conditions, education, sport, culture and so on. Advanced regions stimulate dynamic living more easily than undeveloped regions. Therefore, the EU policy is directed at allocating large resources for achieving convergence among regions, building their competitiveness and encouraging employment.

The importance of cross-border cooperation is increasing. In integrated Europe, supranational bodies play an important role in overcoming regional differences as they are given parts of sovereignty with the aim of bringing about a better standard of living for all citizens. Less developed regions should follow those principles and experiences.

2. Regional inequalities in Montenegro

Montenegro has entered the process of the EU accession but has experienced unfavorable development. Large regional differences have been created in spite of huge efforts by the state to alleviate the inherited regional differences by building road, electric, water supply, waste water and other infrastructure. These large differences prevail, and are unfortunately deepening.

In the rural areas of Montenegro, due to uncontrolled development and the lack of adequate policy for these areas, the dynamics of living have been sluggish for decades. Villages have long been deteriorating. The liveliest inhabitants continually migrate and seek other places to fulfill their ambitions, make their living and start families. A higher standard of living has not been possible in rural settlements due to certain geostrategic, historical and other conditions. In this way, the rural areas were not valued, resources have been abandoned and become dead capital. The migration of the young persons, which is still happening, has caused a continuous degradation of these areas. It has also caused the urban areas to lose their rich surroundings. All these factors have further complicated the development process and caused a distinct disproportion in economic, demographic, cultural development etc. Both, everyday life and economic productivity have been disrupted in rural areas, making life there unviable for many. .

Analyzing the demographic trends through the use of population census in Montenegro, following tendencies are apparent:

- Exhausting of the total population growth
- A continuous decrease of the population growth
- A decrease in the vital index
- Stagnating tendencies of new marriages and an increasing number of divorces
- Constant migration of population from rural to urban areas and their concentration in municipal centers
- An increasing number of empty settlements
- Migration from the northern region towards the central and the coastal region (table 1.0)
- The capital and the coastal municipalities have a positive migration balance
- A growing number of citizens abroad.

Table 1.0 Population structure by regions in 2011,
(source: http://www.monstat.org/cg/)

Region	1953	1961	1971	1981	1991	2003	2011
Northern	43.32	46.19	43.44	39.19	37.17	33.01	28.68
Central	34.56	36.13	38.28	41.00	42.56	43.30	47.,34
Coastal	18.12	17.68	18.028	19.81	20.27	23.69	23.98
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00

The manifested tendencies for the population movement in Montenegro, especially for the undeveloped areas, are very serious and alarming. **The changing development and ecological destiny of those areas are long overdue.** They point to the fact that unequal regional development and large differences are constantly reflecting present structural problems. These manifested tendencies demand a new strategy for regional and economic development in order to balance three vital factors for sustainable development:

- sustainable economy and technology;
- sustainable development based on social balance and succeeding in protecting the environment along with rational use of resources if a dynamic economic development is desired;
- rational valorization of economic and other potentials and the growth of competitiveness of the domestic economy on the road to the European Union.

3. Dealing with disproportionate development

Disproportions in the level of development among the northern, central and coastal regions in Montenegro are very pronounced. According to the official statistics, the northern region accounts for 53% of the country's territory, has huge water potential, all the coal, zinc and lead reserves, 67% of arable land, 78% of wood mass, over 70% of livestock, a large potential for developing winter tourism, ecotourism etc. Despite all of this, the region only accounts for 18% of the Montenegrin GDP. The northern region lags behind the rest of the country both economically and technologically, and unemployment and poverty are on the rise, coupled with constant demographic departure. This region proves the interdependence between demographic movements and the economic and regional development, which, for the decision-makers, points out to the need to make a special development scenario for the country as a whole, as well as for the undeveloped areas.

A good starting point for overcoming the inherited regional differences would be: building and developing traffic, communication and other infrastructure, developing a strong power supply, supporting agriculture and tourism, strengthening entrepreneurship and capital markets and changing the configuration of the economy's structure through more small and medium-sized enterprises in manufacturing and services; further strategies would be strengthening the private sector, forcing new technologies and IT, raising the level of education; the country joining wider integration processes, attracting FDI etc. **The idea – of "help and donations", should be replaced by the idea of "self-sustained development**". Montenegro's development must be adjusted to the capacities of the environment, and the economy must respect the principles of sustainable development.

4. The regions and the neighboring areas

The regions of Montenegro need opportunity to **have more influence on their economic and other types of development** through well prepared decentralization and

the functional grading of authority, law, responsibilities and duties from the local communities to the national level. Regions should become an economically developed union of local communities that are rich in democratic forms. It is in the interest of citizens to have good road infrastructure, good quality education, security and heath systems, a clean environment and so on. Ways of overcoming the inherited disproportions (demographic, economic, political, cultural and other) therefore need to be found so that more realistic conditions for more equal regional economic and, therefore, demographic development can be created; conditions for a decent life in those communities; for an easier flow of capital, goods and ideas, for encouraging entrepreneurship to through and for more a sustainable relationship with the nature.

As regards development and spatial functioning, the regions need to become **equally developed entities and be coherent with domestic and cross-border surroundings.** They must be part of infrastructural, cultural and other **networks**.

Mutual cross-border projects and international cooperation make it easier to receive the support of the European Union and international financial institutions. Such development projects that are directed at producing harmonized economic and trading areas within the regions are gaining in importance as they provide perspective for economic activity.

5. Valorization of the resources in Montenegro

All of the above implies that regional development is a long-term and comprehensive process as part of improving sustainable development of regions and acknowledging their uniqueness at the same time. For the process to speed up and harmonize, a macroeconomic environment is needed that brings Montenegro closer to the European and global economic flows. In addition, there should be a stimulating business environment as well as contemporary education that is enriched with practical skills.

Valuing the natural, tourism and other recourses of the northern region of Montenegro cannot be accomplished without **significant investment, public-private partnership, and urbanization –** the region should be available to investors as well as to potential non-domicile population that would want to live there. This means projects that would revitalize the whole country.

Stimulating policies should also be directed towards investments into existing and new accommodation capacities for winter, congress, rural and religious tourism – the facilities inside the national parks (cycling tracks, sports facilities, children playgrounds etc.) where various cultural, folklore, musical, sports and other events could take place. Besides tourism, development policies should support activities that are easier to organize and will survive as well as quick to form networks – different forms of family businesses, home-crafting, trades, banking, postal and other services, viable agriculture and organic food production, livestock breeding etc.

A detailed regional development policy, supported by entrepreneurs, needs to be coordinated by the national and banking structures, and supported by investment funds, foundations and other local and international financial institutions.

Investment support has to be reflected in longer grace periods, lower interest rates, longer payment periods etc. Projects that employ local resources and are export- oriented necessitate special support, as well as projects that provide employment, those that are power efficient, use clean technologies etc.

In the process of structural adjustments to the domestic economy, turning it into a dynamic, competitive and efficient economy that is integrated in the EU, there must be a wide collaboration starting with entrepreneurs, regulators to employees. The education level of the population and public responsibility of economic entities also need to be raised to a higher level.

6. Conclusion

Montenegro has pronounced regional inequalities that are currently widening, which puts great responsibilities on decision-makers of economic and development policies to eliminate the disparities, to revitalize rural areas, to make the country self-sustainable in energy terms and to use new technologies and know-how.

The territory of Montenegro, which is a rare and valuable resource, must be functionally valorized to suit the infrastructural, industrial, agricultural, energy, tourism and other aims. Also, the growth of cities is dependent on valuing the qualities of rural areas so that these develop attractive living conditions. **Future development of Montenegro has to be adjusted to the capacities of the environment,** which in other words means that the economic policies must obey the principles of sustainability. Future business models will have to apply only those modern technologies which will not put undue strain on the environment. Strategic directions of the future economic, scientific, technological, social and cultural development must fulfill the needs of future generations by developing its economic base, improving human resources and standard of living, identifying developing projects and their potential, but at the same time focusing on the necessary infrastructure – water, power supply, waste water, telecommunication as well as education, local institutions and so on.. Experiences of other European development policies are always useful and irreplaceable. Montenegro's future depends on its commitment to revitalizing its rural areas and overcoming regional disparities.

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THE COMPETITIVENESS OF RURAL AREAS IN THE REPUBLIC OF TATARSTAN

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Abstract: This paper analyses the main factors influencing the regional competitiveness of rural areas in the Tatarstan Republic. Firstly, 19 variables related to the socio-economic situation in the Tatarstan Republic were analysed, these having been taken from the Statistics Committee of the Tatarstan Republic. Principal component analysis (PCA) was then used to determine the weights of 10 indicators that have an effect on the level of regional competitiveness. Factor weights are used as weights in the summation of the standardised scores of variables that have an impact on competitiveness. The major factors influencing the level of regional competitiveness are the level of economically active population, investment in housing and the level of education. The following results were obtained: one of the 44 regions is very highly competitive and two are highly competitive; two of 44 regions have a medium level of competitiveness and 39 regions have a low level of competitiveness.

Key words: regional competitiveness, rural development, agrarian areas, Tatarstan Republic

1. Introduction

For both political and economic reasons, and due to rapid technological growth, the current situation of global change requires new approaches to social and economic development, both for the whole international community and for individual states. This issue has now become a political priority, especially for Russia. Success in Russia's foreign policy will be linked to the level of economic development as well as the efficiency of economic relations with foreign countries. As competitive regions can be considered a factor in economic growth, the development of regional competitiveness will play an important role in Russia's relations with international organisations such as the World Trade Organisation (WTO), the Organisation for Economic Cooperation and Development (OECD) and others.

Nowadays, the issue of regional competitiveness is still poorly studied in Russia, among other reasons because it is often equated with effectiveness. (However, this is not the right approach, because although the former is based on the latter, regional competitiveness also includes a number of variables characterising both the external and internal environment.)[1] In Russia, rural areas cover two thirds of the territory and are home to 27% of Russian population. The question of rural development represents one of the main problems for the Russian Federation, and therefore receives great attention from the government. Within this issue, the improvement of the competitiveness of the Tatarstan Republic ihas long been one of the most pressing problems, and the scientific community is therefore called upon to determine the level of competitiveness at a sub-regional level and to understand the factors affecting it.. Consistent and effective policies which promote a high level of competitiveness are desirable, in order to give rural regions an opportunity to enhance their economic growth, providing them with a worthy place in the federal structure. Thus, it is necessary to consider the currently existing methods and techniques for the assessment of regional competitiveness.

The measure of competitiveness which is presented here is related to the potential and innovativeness of the region rather than to its actual economic performance. The study therefore offers a representation of regional competitiveness which differs greatly to the general perception of business competitiveness.

To increase the competitiveness of an individual region, the factors affecting competitiveness must first be determined. The competitiveness of a region is defined by its geographical position, as well as the level of social development (the number of urban residents, the level of education) and economic indicators (wages, investments, labour force, etc.). An analysis of the aforementioned indicators will identify the most competitive regions, thus making it possible to determine the most competitive region and the reasons for this. Further analysis will uncover which factors influence competitiveness. Using this data we can conclude how to manage these factors most effectively in order to improve the competitiveness of individual regions.

The aim of this paper is to analyse the competitiveness level of Tatarstan's sub-regions and to clarify the principles of assessing regional competitiveness. This paper consists of 4 remaining sections. Section 2 is devoted to theoretical issues, examining how experts and Russian scientists in

particular determine regional competitiveness. In section 3, we introduce the various statistical data which will be used for the measurement of regional competitiveness in this paper. Section 4 presents the results of the study, these being discussed in section 5 before conclusions are drawn.

2. Theoretical orientation

The problem of competitiveness has been the concern of many Russian scientists, such as Shekhovtseva (2001), Ushvitsky (2005), Danilov (2007) and others. These researchers have first tried to define the concept of competitiveness before determining the competitiveness of a region.

The most common concept of competitiveness used in the scientific community is the definition of Porter, one of the first scientists in this field. His definition describes competitiveness as "a property of goods (services), the subject of market relations acting in the market with the similar products, services or competing entities of market relations" (Porter, 2000, p. 21). Noticeably, the definition only describes goods. According to Shekhovtseva's definition, competitiveness is the ability to perform functions with the required quality and cost in a competitive market (Shekhovtseva, 2001). Of great importance is the fact that it is impossible to compare the competitiveness of a region with the competitiveness of firms. First, if firms are non-competitive and do not hold a strong position in the market they go bankrupt, whilst a region does not cease to exist if it is not in a leading position. Secondly, a region creates favourable conditions for the neighbouring regions when it becomes competitive, thus giving those new opportunities for development. In the case of an enterprise, the success of one player generally results in a less successful outcome for the others. Thirdly, the success of a region is measured by the creation of new jobs and an increase in both quantitative and qualitative employment.

Ushvitsky and Parakhina define competitiveness as "the ability to provide a high standard of living and income to the population, as well as the efficient use of available economic capacity in the region in the production of goods and services" (Ushvitsky and Parakhina, 2005, p. 1), and this is echoed by Danilov (2007). In this case, the definition should include the following three fundamental aspects:

a) standard of living must be brought to a higher level;
b) functioning of the regional economic mechanism should be effective;
c) the region should be attractive to investors.

Thus, we can make a comparative analysis of currently existing definitions of regional competitiveness. Definitions usually include the following elements:

- a high quality of life;
- the implementation of the economic potential of the region;
- the ability to create and ensure the investment attractiveness of the region;
- the creation of conditions in the region which help to maintain a competitive advantage in all areas;
- the production of competitive goods and services;
- the achievement of a high gross regional product (GRP) per capita.

According to Porter's research, the development of regional competitiveness can be seen as developing in four stages. The first stage assumes a competition based on factors of production. This includes the natural resources of the area, favourable conditions for production and sales of manufactured products, and a skilled workforce. At the second level, competition is based on investments. These can be investments in technology and education, as well as in providing various kinds of licenses. This is followed by the third stage, namely competition based on innovation, which could include the creation of new products, new services, processes or organisational decisions. Finally, the last stage of competition The first three levels can stimulate economic growth, but without sufficient capital stage there may be stagnation and decline (Shekhovtseva, 2001).

Various ways of measuring competitiveness can be found. Buckley et al. suggest the following methods:

1. Measures of performance. Among the most common of these are calculated indicators of profitability, market share growth, balance of trade; you can also select an/ the index of comparative advantage (RCA - Revealed Comparative Advantage);
2. Measures of competitive potential. These show the accessibility of cheap raw materials and emerging technologies;
3. Measures of the competitive process. These indicators often measure the qualitative side, and can be compared with the assessment of the management process. Their primary task is to translate the competitive potential of competitive achievement. (Buckley et al., 1988).

The World Bank proposes its own methodology to assess the well-being of the region, identifying four main indicators which are calculated per capita, namely the size of the gross regional product, the amount of productive resources, the value of natural resources, and the value of human resources (Shekhovtseva, 2001).

Regional competitiveness has also been studied in other parts of Europe (Annoni, 2010). For these purposes, the following indicators are usually used: economic performance, the employment and labour market, indicators relating to education, research and innovation, telecommunication networks, transport and internationalisation. Thus, the economic indicators include those such as the value of the gross domestic product per capita in purchasing power standards. It is necessary to carry out a comparative analysis of the dynamics of this indicator for a more detailed examination thereof, as well as a detailed study of its various branches. It is advisable to study it in terms of at least three main sectors: agriculture, forestry and fisheries, industries and the service sector. The group labour market and employment includes the following indicators: the employment rate (the ratio of working population aged 15 to 64 years among the general population in this age group), the unemployment rate (the number of unemployed people within the active population),

long-term unemployment (the number of people unemployed for longer than 12 months) and the average number of hours worked per week. The main indicator in the next group is the percentage of people with higher education. This category includes the proportion of the population whose level of education corresponds to levels 5 and 6 according to the ISCED classification. Innovation Group is characterised by the number of patent applications that are submitted to the European Patent Office (EPO). It is believed that this figure may reveal the dynamics of the research sector. However, it should be noted that the newest EU members are dissatisfied with this definition, because most of them have adopted the tradition of filing patents in a given society, and thus consider this approach unfair. If possible, a budget for research and development as a percentage of GDP and the population engaged in R & D should be estimated. The indicator of the availability of internet access in private households and organisations is chosen as the main indicator for the next group. The category of transport will be judged in terms of the following parameters:

- length of the motorway network with the calculation of length density per million inhabitants;
- transportation by air, with a calculation of amount of goods loaded and unloaded;
- sea freight, with a calculation of the amount of goods loaded and unloaded.

Some difficulties arise when assessing the latter group because data is lacking at the regional level, so this can be evaluated only at the level of the country. For this purpose, the following indicators are used:

- exports and imports by product types and towards the population;
- average annual growth rate of exports / imports;
- incoming foreign direct investment in both absolute value and percentage of GDP;
- the average incoming and outgoing flows of foreign direct investment relative to GDP.

There are however different concepts and criteria for the evaluation of regional competitiveness across countries. For example, the concept of competitiveness in the UK concerns the stability and development of the business environment and the economic well-being of citizens. Competitiveness is defined as the ability of the economy to attract and retain companies with stable development and growth of living standards. Competitiveness of the region is seen as the result of a complex interaction of three main groups of indicators: production factors, output factors and the resultant factors.

There is another definition of competitiveness in Croatia, namely as "a range of factors, policies and institutions which determine the level of productivity" (Annoni & Kozovska, 2010, p. 23). Before determining competitiveness, indicators must be selected, these being characterised primarily by two major economic areas of this country - the business environment and the quality of the business sector. 135 indicators were selected for the analysis, which are combined into eight groups. To assess the business environment the following data were selected: indicators of demography, health and culture;

- data on education;
- basic infrastructure and public sector;
- infrastructure business.

The following data were selected to assess the business sector directly:

- investments and trends in entrepreneurship;
- level of development of entrepreneurship;
- economic performance, reflecting the real situation;
- economic performance, reflecting the trends and patterns.

Quantitative analysis is based on the methodology IMD (intermodulation distortion) according to which more than 100 indicators are needed in order to calculate sub-indices. These sub-indices are then used to calculate the two main indices. Competitiveness is calculated as a weighted average of the two sub-indices. Different weights are given to the business environment and quality of the business sector. The weights are calculated on the basis of the World Economic Forum. Finally, the overall regional competitiveness index is calculated as the average after standardisation (Annoni & Kozovska, 2010).

For Finland, the definition of regional competitiveness is yet another: the ability to favour regions to attract and support economic activity so that its citizens have a relatively good economic health.

Shekhovtseva and Danilov both recognise that despite the presence of well-established international research on issues of competitiveness at national level, some of the indicators used become unavailable or meaningless at the regional level (Shekhovtseva, 2001; Danilov, 2007). For example, indicators reflecting the efficiency of the public sector or barriers to trade do not change within a country, and thus are considered inappropriate for regional comparisons, especially when examining only one country.

In the case of Finland, the index is calculated using available indicators on the labour market, as well as indicators that show innovation and agglomeration areas. Four groups of indicators of competitiveness were identified:

1. human capital;
2. innovation;
3. agglomeration;
4. availability.

These four main aspects describe 16 variables for 85 Finnish sub-regions.

It is interesting to note that any indicator associated with the sphere of the economy has not been included for the calculation of the index. In fact, economic performance and welfare, such as GDP per capita and personal income, were included later in the study of correlation between them and the index of competitiveness. The relationship between the index and short-term output indicators, which include changes in production, employment and population, were also evaluated.

Human capital is measured by five variables: the number of people with higher education, the total number of students, the number of students of technical specialities, the size

of the population of working age (15 to 64 years), and the participation rate in the labour market.

Group "innovation" captures four variables: the average number of patents between 1995 and 1999, spending on R & D, the share of enterprises that were innovative in the years 1985–1998, and the share of value added produced in the field of high technologies.

Agglomeration of firms and economic activity is described by four parameters: population density, the proportion of workers employed in sectors where external economies are large (manufacturing, wholesale trade, retail trade and private services), the proportion of workers employed in business services, and the size of the largest sector in the sub-region.

The three variables for accessibility reflect the following information: the distance from one sub-region to another, calculated from the size of the sub-region, the distance to the airport, as measured by the size of airports, and the share of firms in the sub-region involved in foreign trade. It should be noted that the availability of rail transport was not considered because of the unavailability of data at the sub-regional level, and also because of the dominant role of road and air transport for trade in goods [Annoni, 2010].

3. Data and method

Tatarstan Republic is part of the Volga Federal district which includes Kazan and 43 regions. It covers 0.4 % of the territory of Russia and 2.6% of the Russian population (3.803 million people) live there. The GDP of the Tatarstan Republic is about 1250 billion rubles, which is 2.3% of the Russian total.

The Republic of Tatarstan is one of the Agricultural leaders in the Russian Federation as well as in the Volga federal District.[2] The Republic takes a leading place in the production of basic plant products (first place in the gross harvest of potatoes, fourth place in the gross harvest of sugar beet) and livestock (the second largest producer of milk, the third largest producer of livestock and poultry).

As of the 1st of January 2012, the population of the Tatarstan Republic was around 3.8 million, around 2.9 million of whom live in urban areas while only 24.3% live in rural areas, despite some regions not having an urban population, including Aktanyshsky, Alkeyevsky, Verkhneuslonsky, Vysokogorsky, Drozhzhanovsky and others.

Each region has its specific, unique characteristics which determine the competitiveness of the region. Competitive advantages of the region are defined by differences, not similarities. The region becomes competitive if adaptation of the industrial structure to market methods of farming occurs more rapidly, when the authorities support core companies, and a sensible economic policy is carried out. The competitiveness of the region is not a short-term phenomenon. Conditions must be created which are stable and will have a lasting impact. In these conditions it is necessary to take care of the population as the competitive economy requires employment and reduction of unemployment. In summary, all actions should lead to the increase in real income and standard of living.

We have chosen 19 indicators which demonstrate the social and economic situation in the Tatarstan Republic. Indicators of socio-economic development were provided from the State Statistics Committee of the Tatarstan Republic in the year 2010:

- revenue from 1 ha of arable, thousands of rub.;
- total number of population, people;
- average total working-age population;
- total wages, millions of rub.;
- the average monthly wage, rub.;
- financial results for all enterprises and organisations, millions of rub.;
- private investments, thousands of rub.;
- size of private investments for housing, thousands of rub.;
- motor roads, km;
- the number of housing commissioned, m^2;
- whole volume of agricultural products, millions of rub.;
- area of district, km^2;
- the total urban population, people;
- the number of residents with higher education, people;
- the number of residents with secondary professional education, people;
- the number of residents with initial professional education, people;
- the number of residents with only primary education, people;
- increase of population, people;
- average monthly wages in agricultural sector, rub..)[3]

In accordance with the purpose of the study, we employed the method of principal component analysis. According to this method, 19 indicators of socio-economic development in the Republic of Tatarstan were selected. This method permits a reduction of the dimension of data where the least amount of information is lost. As a result, we selected 10 indicators which have a greater impact on the competitiveness of the region.

After this, we standardised the data which had the largest impact on regional competitiveness. Standardisation was achieved by assigning the value one to the highest value of a variable in a certain region and subsequently computing ratios for the other 43 regions. For this purpose we used the following formula:

$$y_{ij} = \frac{x_i - MIN\ x_1, x_2, x_3, \ldots x_n}{MAX\ x_1, x_2, x_3, \ldots x_n - MIN\ x_1, x_2, x_3, \ldots x_n} \quad (1)$$

where

y_{ij} – computed variable for i indicator and j region;
x_i – indicator;
n – number of indicators.

The next step was the multiplication of the data after standardisation with data weights obtained by PCA and summation. Eventually, the index of regional competitiveness was calculated using formula (1) for standardisation.

4. Results

This component is the regional competitiveness, which explains about 91 per cent of the total variance. The 10 variables mentioned in Table 1 have high loadings (weights) on the component which can be clearly labelled as competitiveness. Consequently, we continue to use these indicators in our analysis.

Many factors influence the formation of competitiveness. Conventionally, they can be divided into basic and providing factors. Under basic features, those features can be understood which the region has possessed for a long period of time. These, for example, can include natural resources, human capital (level of education), and the utilisation of scientific and technological progress. Providing features can be understood as a system of management in the region, a process formed and implemented by economic mechanisms. These components include economic, political and social characteristics. The institutional component of competitiveness can also refer to providing factors. This feature is essential for the ordering of relations between economic entities in the region, and promotes the efficient use of the basic components of competitiveness. Infrastructure plays an important role in the region, as it enables the region to turn their potential into real competitive advantage.

The most important variables are the ones related to population, motor roads, housing and level of education

Table 1. Weights of selected variables

The name of selected variables	Component of competitiveness
1. Population with higher education, people	0.992
2. Population with great school education, people	0.975
3. Total population, people	0.973
4. Economically active population , people	0.972
5. Size of private investments in housing, thousand rub.	0.969
6. The number of urban population, people	0.969
7. The number of housing commissioned, sq. m	0.968
8. Population with secondary professional education, people	0.958
9. Population with initial professional education, people	0.952
10. Motor roads, km	0.813

Source: own calculations.

The importance of the role of infrastructure for transport is recognised all over the world, and in an increasingly interconnected world, the transportation system increases in relevance. Entrepreneurs need to ensure reliable access to other economic entities when they conduct any activity businesses, as well as bearing in mind the cost of transport. This can be very high, highlighting the importance of developing a high-quality regional transportation system.

Human capital is also crucial given that people affect all of the processes occurring in the region, and make decisions which will later have a direct impact on regional competitiveness, bringing about progress which they would enjoy themselves. Therefore, we believe that it is essential to manage indicators such as education, and the training of qualified staff and management. On the one hand, it seems impossible to influence some of the indicators in the short term (this can be attributed to demographics), while on the other hand, there are many factors that can and should be managed. For example, the Republic of Tatarstan carries out many competitions to support talented young people. Successful young people begin to participate in projects such as personnel reserve, thus forming qualified management. Another example is the project "Algarysh", through which hundreds of graduate students and young scientists can study in foreign countries, accumulating useful experiences for future activities as a result.

Housing also has a great impact on regional competitiveness, being one of the most serious issues in Russia as a whole as well as in the Tatarstan Republic specifically. Many young people have to wait for a long time before they can afford to buy their own accommodation, often delaying marriage and having children for this reason. Some indicators can thus be improved if the government and local authorities pay more attention to this problem. Some federal programs are directed to provide the population with affordable housing but it is deficient, especially in rural areas.

The levels of competitiveness were established using a deterministic method for pattern recognition based on existing data. We determined levels of competitiveness for every region of the Tatarstan Republic and divided the areas of analysis into four groups according to the degree of competitiveness: from 0 – up to 0.1 – less competitive (areas with a low level of competitiveness), from 0.1 – to 0.2 – competitive areas (areas with a medium level of competitiveness), from 0.2 – to 0.3 – more competitive areas (areas with a high level of competitiveness), and from 0.3 – to 1.0 – markets leaders (districts with a very high level of competitiveness).

Table 2 shows a regional competitiveness index of the first ten regions in the Tatarstan Republic that have higher values for this indicator.

The final results can be found in Figure 2.

Table 2. Regional competitiveness index for Tatarstan Republic

Name of region	Competitiveness index
Kazan	1.000
Tukaevsky	0.264
Nizhnekamsky	0.211
Zelenodolsky	0.148
Almetyevsky	0.136
Bugulminisky	0.065
Leninogorsky	0.062
Yelabuzhsky	0.057
Arsky	0.049
Nurlatsky	0.049

Source: own calculations.

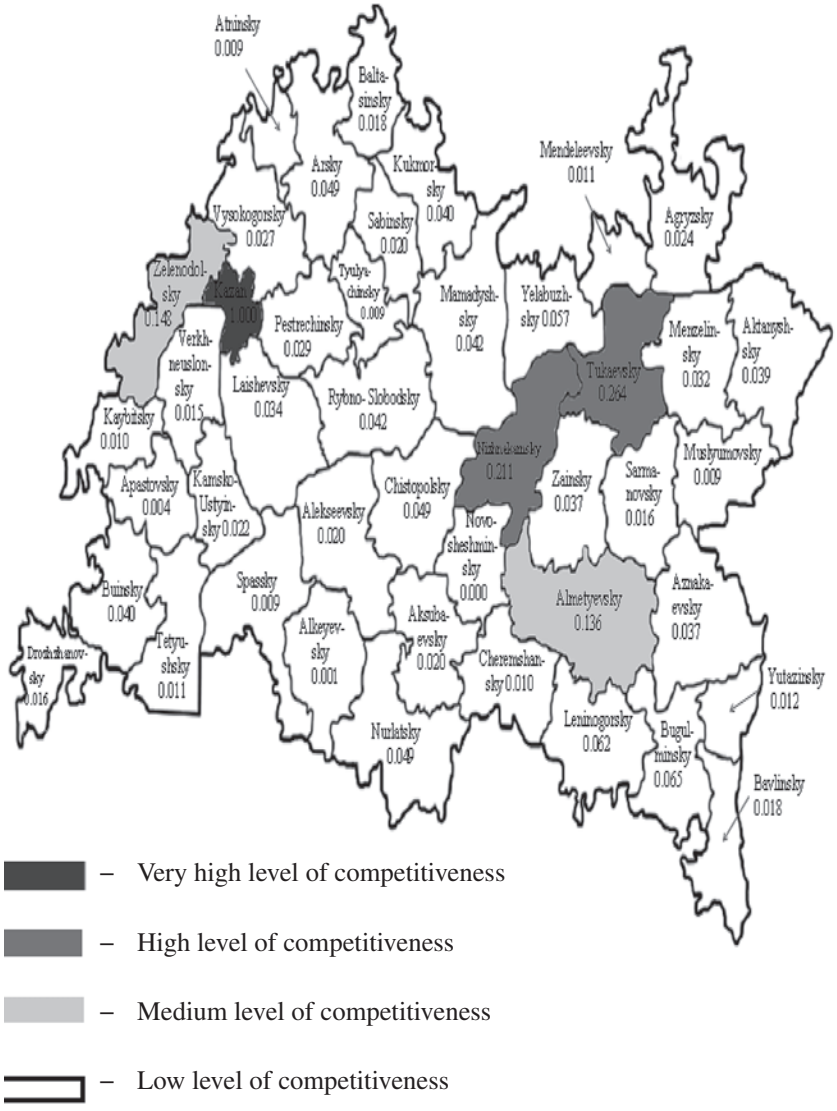

Figure 2. Ranking of districts of the Tatarstan Republic by level of competitiveness

It can thus be seen that there is one region in the Tatarstan Republic which earns the label market leader, namely Kazan. This can be explained by the fact that Kazan is the centre of the Republic. It has the highest proportion of investments, construction of housing, and level of education. Many people wish to move there from rural areas, as they can find better facilities for living, study, leisure and so on.

Two regions, Tukaevsky and Nizhnekamsky, have a high level of competitiveness. Two large towns are situated in these districts, these being Naberezhnye Chelny and Nizhnekamsk. These have better living conditions and therefore attract a higher population. Two regions are of a medium level of competitiveness, namely Zelenodolsky and Almetyevsky regions. These two regions have good positions in terms of many indicators and a convenient location near the leading regions. These districts produce various agricultural goods, as well as having various other industries and mineral deposits. The remaining 39 regions have a low level of competitiveness.

5. Conclusion and discussion

This study was conducted in order to identify the competitiveness of the various regions of the Tatarstan Republic as well the factors affecting their competitiveness. The results highlight various problems in the Tatarstan Republic. Only one region can be identified as a market leader, while two are highly competitive and two have a medium level of competitiveness. The others (39 of 44 regions) are associated with lower socio-economic conditions. The results suggest that the government and especially local authorities should pay more attention to the development not only of large districts and industrial complexes, but also to sub-regions and agriculture.

A great number of different conditions influence regional competitiveness, both objective and subjective. The economic situation in the country also affects the level of competitiveness. It is also necessary to pay attention to the specifics of individual industries and facilities that are located in the region. The economic independence of economic entities of the Russian Federation determines the financial and economic situation in the region. The region should have socio-economic, scientific, technological and human resources which can develop steadily. This makes the region more attractive as it hosts a greater number of economic activities. which in turn creates new jobs. The more employment, the higher the socio-economic well-being of the population and better the financial status of the budget of the region, these being the most important indicators for regional competitiveness. The research showed that the most influencing variables are housing, transport infrastructure and education. People in the Republic of Tatarstan, as in the Russian Federation as a whole, have difficulties in purchasing accommodation. Roads should also be improved because of their direct impact on different branches of the economy.

The results of our study show that there is a big difference between the capital of Tatarstan, Kazan, and other regions. Kazan is called the third capital of Russia, and it is at present one of the industrial and cultural cities of Russia. It has a variety of types of infrastructure, including business, social, cultural and entertainment infrastructure. All of this creates many jobs, leading to many people from the surrounding regions aspiring to move to Kazan.

There are two leading industries in Tatarstan, these being the oil industry and agriculture. Naturally, the oil industry is the most profitable and brings in a lot of revenue, as is evident from the results. The second group of competitive regions consists of precisely those regions with a booming oil

industry. In contrast, the farming regions are uncompetitive. This creates a huge imbalance between the regions, especially affecting working conditions and wages, and is the reason why so many people prefer to leave the countryside.

In rural areas, only primary and secondary education is available. Young people therefore have to go to Kazan to become professionals, living here for about five years to participate in higher education. It should be noted that in rural areas, social and entertainment infrastructure are poorly developed, leading to the commonplace desire of young people to stay in the city where it is easier to find a job with the prospect of career growth.

The government is developing programs for the development of rural areas, allocating money to build new schools and kindergartens. New facilities for sports are built in the countryside, but experience shows that this is insufficient. One of the current priorities of the government, in our opinion, is to attract young people back to rural areas. Wages must be increased and new homes built in order to attract young people. If some universities in Kazan set up outposts of training centres and student towns in the countryside, containing research centres and laboratories, new jobs would be created for local residents as well as for scientists. Offering opportunities for education in rural areas might reduce the influx of people to Kazan, thus bridging the gap between Kazan and other regions.

Another important point is the development of small businesses in rural areas. Almost all businesses are located in Kazan, and the rural population must travel to Kazan if they want to buy something. This applies to nearly all industries, from clothing to furniture. Even if the shops in rural areas offer some of the products, they are of poor quality or overpriced. If the government allowed small businesses to appear in rural areas and fully supported them, though it would be necessary to monitor the quality of the goods they offer, this would also make rural areas more attractive compared to Kazan. One possible new direction may be the development of online stores, allowing rural residents to buy the necessary goods in the comfort of their own homes. Despite the many advantages of online shopping, including lower prices and the wide range of products, this industry still has a long way to go in terms of development. Another problem in Russia currently, particularly in Tatarstan, is the lack of internet connection in many villages. Although the government is trying to improve this situation, they are prioritising providing schools with internet. Moreover, most old people are unacquainted with the internet or even with computers. Many families have computers but these are usually used by schoolchildren or students. Courses in computer training and the development of the internet are already available in many cities. These courses could be organised in rural areas. Until now, no system of electronic payment has been developed in the Republic. Many people are afraid of such payments because they often hear about hacking scandals, an issue not only in the Russian Federation but also elsewhere. If law enforcement authorities were more vigilant about such crimes, people would be more empowered to use technology, a great levelling factor between rural and urban areas.

Human health also remains an important issue. Today's government makes a lot of effort to develop health infrastructure in rural areas, building various sports facilities and fitness studios. Clean air, environmentally friendly products, and exercise are essential to maintaining good health conditions. With added investment in the quality of life in rural areas as well as social advertising as to its benefits, the influx of people into cities of the Republic may be reduced.

Notes

1. Usually when scientists talk about the region's competitiveness in Russia, they mean the efficiency of the manufacturing industries in the region. This is calculated in terms of profit,*)*. Unfortunately, the methods that we use in this article have not yet developed in Russia).
2. The Russian Federation comprises 83 Federal entities. Federal entities are grouped into eight Federal districts, each administered by an Envoy appointed by the President of Russia.
3. The following information is available from the authors upon request: the administrative division of the Tatarstan Republic; socio-economic data of the Tatarstan Republic; the data matrix after the transformation of each variable that has an impact on competitiveness and a full list of regions and their regional competitiveness index.

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OPPORTUNITIES, PROBLEMS AND PITFALLS OF NUTRITION AND HEALTH CLAIMS

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Abstract: The provision of reliable food information, for instance by printing an authorised nutrition or health claim on a package of food, makes credence dimensions of a food transparent to the consumer. In Europe, prior-to-use authorisation of nutrition and health claims are mandatory and governed by Regulation (EC) 1924/2006. The aim of this paper is to assess the problems and pitfalls of the European claims regime to food businesses. A legal-economic review is performed, supported by case studies. Strategic factors determining whether or not to claim are of a legal-economic kind. Strategic responses include refraining from the use or application of claims, abstaining from innovation, and/or circumvention of the authorisation procedure. Negative social-economic effects make it necessary to improve the present legal structures with respect to their effectiveness while maintaining the balance between public control and individual freedom.

Key words: nutrition claims, health claims, food information, pre-market approval, food law

Introduction

Food businesses and their operators (abbreviated henceforth as FBOs) can obtain a competitive advantage by attaching a claim to their product. Nutrition and health claims[1] therefore represent an incentive for product innovation. Food information can affect consumers' choices in the market (see for instance: Bremmers *et al.,* 2012). Claims can bridge the information gap that exists between the knowledge available to the buyer and the seller's informedness on the intrinsic qualities of a food (Hobbs and Kerr, 2006). The credence character of foods – together with the positive incentives that may be harvested in the market – make the application of legal rules vulnerable to opportunism. For this reason, the use of claims is bound to legal limitations in the Claims Regulation (EC) 1924/2006 (abbreviated as CR). However, a strict regime also contributes to pre-market uncertainty and therefore forms an economic risk to FBOs, meaning that they are unsure whether they will ever be able to harvest the fruits of product innovation. This uncertainty is especially if the burden of scientific substantiation is put on the shoulders of the claiming food businesses. This is notably the case in the EU, and has economic consequences. The institutionalised system of CR affects the way contracts are concluded upon (the 'play of the game') and the allocation of resources (c.f. Williamson, 2000). It is not clear what effect strict authorisation procedures have on the functioning of food markets, the competitiveness of single FBOs or on the European food industry as a whole. Moreover, a negative *ethical* aspect of claim approval is the limit to freedom of speech by food businesses. In the USA, so-called 'qualified health claims' may be allowed (as a result of the Case Pierson – Shalala, 164 F.3d 650, 1999; Fortin 2009: 380). These claims are not – and need not to be – underpinned with full scientific evidence, but are expressed by weighing up supportive and conflicting research. The differences between the EU and the US are possibly rooted in the European reaction to stakeholder scrutiny after the food scares in the middle of the 90's (see for instance: White Paper on Food safety 2000; Knowles and Moody, 2007; Van der Meulen and Van der Velde, 2008). In the end, however, European public authorities have virtually neglected businesses' freedom of speech (Van der Meulen and Van der Zee, 2013).

The aim of this article is to assess the problems and pitfalls of the EU's claims regime for food businesses and to categorise the strategic options FBOs have to deal with it. By elaborating on the impact of claim requirements, lessons may be learned for improving the legal-institutional system. The paper is based on a systematic legal-economic analysis and will include data and cases of accepted and rejected food claims.

[1]According to Article 2(2)(1) of the Claims Regulation (1924/2006) 'claim' means any message or representation, which is not mandatory under Community or national legislation, including pictorial, graphic or symbolic representation, in any form, which states, suggests or implies that a food has particular characteristics.

In the remainder of this paper, the European claims regime will first be addressed. Next, the strategic and economic factors which are to be considered when a claim is made from an FBO-strategic perspective are reviewed. After this, alternative strategic options which are available to FBOs are described. Finally, the conclusions and discussion are presented and a way forward for politicians and scientists is proposed.

Claims in the EU

European food information is influenced by the tradition, culture and the specifics of the institutional environment. Examples are the labelling and legal requirements of GMO, as well as the absolute ban on the use of hormones in the production of beef (see for instance: Herrick, 2005; Heslop, 2006). The specific properties of a food (identity, origin, etc.) that have to be indicated on (pre-packaged) or near (not-prepackaged) foodstuffs enable informed choices, counteract unfair competition and foster the free exchange of goods. The bottom-line is that the consumer should not be misled. The general prohibition to mislead is included in Article 7 of the recently accepted Food Information Regulation (EU) 1169/2011 (abbreviated as FIR). Claims – whether they are nutrition or health claims[2] - should therefore be used in a fair way.

According to Article 2 of Regulation (EC) 178/2002, 'food' (or 'foodstuff') means any substance or product, whether processed, partially processed or unprocessed, intended to be, or reasonably expected to be ingested by humans. Point (e) of Article 2 excludes medicinal products from its scope. Medicinal products include products presented as having the property of preventing, treating or curing a human disease. Moreover, it is in general forbidden (besides exceptions) to attribute the property of preventing, treating or curing a human disease to any food, nor is it allowed to refer to such properties (referred to as 'medicinal claims').

Claims (1) can only be made if authorised and (2) authorisation is only granted after scientific substantiation of a submitted claim. Despite the fact that there is a general prohibition on making claims with respect to the prevention, treatment or cure of a disease, it is allowed to make claims of disease risk reduction and claims referring to children's development and health under specific approval conditions (so called Article 14-claims). Generic health claims (such as: 'calcium is good for a healthy bone structure'; Article 13(1) claims) are authorised via milder procedures, but nevertheless pre-market approval is- required.

Strategic factors

Strategic factors in considering whether 'to claim or not to claim' (Food Valley, 2010) are legal and economic of a kind. These are interrelated, as compliance to legal requirements induces costs as well as benefits for FBOs. Strategic considerations may be related to: (see: among other: Food Valley, 2010; also extensively in Bremmers *et al*., 2013):

- food information consequences;
- claims application procedural barriers;
- consequences of claims violation;
- legal uncertainty.

Food information consequences

The consequence of using a claim is *compulsory nutrition information* on the food packaging (Article 7 CR; in this context see also: Capacci *et al.,* 2011). The nutrition declaration provides information on the energy value of a foodstuff as well as on its key nutrients (Annex XIII of the FIR, Part A). In the near future, this factor will lose its significance as a nutrition declaration will be *mandatory* for almost all foodstuffs[3]. Moreover, in many cases, businesses already print the nutrition declaration on the food packaging on a voluntary basis.

Claim application procedures

Claim application procedures are complex, and their outcomes uncertain. The applicable procedure depends on the type of claim that is requested - nutrition or health - health claims are in turn subdivided into Articles 13 and 14 type claims. All types require substantiation with generally accepted scientific evidence (for a more extensive description, see Povel and Van der Meulen, 2007). More specific criteria for allowable scientific evidence are not included in the Regulation itself. The general principles are included in guidance documents which lack legal status[4]. Scientific evidence is to be evaluated in an objective way and generally only intervention studies on healthy humans carried out professionally are accepted, which contributes to the perceived uncertainty of applicants. A further factor influencing the uncertainty of the outcome is the fact that the process may not be free of political interdependencies. Scientific evidence is verified under the responsibility of an EFSA panel that consists of assigned scientists from the Member States. It is the European Commission (hereinafter: the Commission) that takes the final decision. The complexity and uncertainties connected to the authorisation procedures contain risks to such an extent that small and medium-sized companies cannot easily permit themselves to enter the process.

Compliance and boundary violation

Health claims are bounded by the general prohibition to suggest that a foodstuff has a direct effect on a disease. There remains discussion remains as to what exactly this implicates in terms of food information. If a claim is made with respect to a food reducing a risk factor for a disease, this

[2]For definitions see Article 2 of the CR.

[3]Some exceptions remain – such as alcoholic beverages with an alcohol percentage > 1.2%/ vol.

[4]See in this respect http://www.efsa.europa.eu/en/efsajournal/doc/2170.pdf

is considered acceptable by the Commission (Article 14(1)(a) of the CR). The borderline between an allowed health claim and a forbidden medicinal claim is diffuse (see Klaus, 2005 for more detail). Even the border between a health claim for a food and a presentation that turns a product into a medicine is diffuse. For instance, is garlic in capsule form – to which positive attributes are assigned pertaining to digestion – a medicine or a food? (see: 'garlic' case C-319/05). Violating the CR by suggesting curing properties could implicate that the 'food' is regarded as 'medicine', with the consequence that the product must be removed from the market immediately and fines paid[5].

Legal Uncertainty

This sub-section refers to the uncertainty in the authorisation process and – after authorisation - the uncertainty in the application of the claim. At the date of writing, 30 nutrition claims and 243 health claims[6] (of which 222 are generic health claims) have been allowed. For 1631 health claims authorisation has been denied, while 2303 health claims are still under consideration (including 2232 claims which are 'on-hold', especially claims referring to foods with plants or plant extracts, so-called 'botanicals'[7]. While a claim is 'on-hold', the respective products may be marketed pending further decision making by the Commission.

Next, the uncertain outcomes of claims procedures are demonstrated through two case studies, one with a positive outcome and one with a negative result.

The Danacol® case

Danone requested the Commission's permission to use a health claim, with reference to Article 14(1) - (a) of Regulation 1924/2006, worded as: "Danacol® reduces LDL-cholesterol by 10% in 3 weeks, and the reduction is maintained with daily consumption. High blood cholesterol is one of the main risk factors in the development of (coronary) heart disease". In the context of this claim, it was ascertained that elevated low-density lipoprotein (LDL) blood cholesterol is a risk factor for coronary heart disease (CHD). The target population of Danacol ® is adults with mildly raised cholesterol levels. After studying 23 publications, 19 controlled human studies, 1 uncontrolled human study, 3 meta-analyses on the effect of phytosterols on LDL-cholesterol and two unpublished meta-analyses, a favourable EFSA opinion was stated: "a biological significant LDL-cholesterol lowering effect can be achieved by a daily intake of 1.6 g phytosterols added to low fat fermented milk products". However, EFSA only advises; it does not have the final say. In May 2010, that is 9 months after the favourable opinion of EFSA, the Commission Regulation with respect to the health claim was published (Regulation (EU) No 384/2010), however under different conditions/ wording than was applied for. Supposing that EFSA took at least 5 months to provide its opinion, the total time taken until acceptance was 14 months or more. The bureaucratic system of application is the main cause for the delay in this case.

In practice, many claims are found not to satisfy the criteria which are set for substantiated scientific evidence, these being a proven cause-effect relationship (in terms of dose-response, specificity, consistency, strength and biological plausibility), indication of the quantity that has to be consumed to bring about the effect and pattern of consumption, as well as specificities about the data gathering process (composition of the study group(s), target population, etc.), and of course the specific beneficial effect on health which is suggested (see in this respect: EFSA Journal 2011; 9(6):2233; EFSA guidelines for the submission of health claims).

The LGG-case

Several subsequent claims relate to the positive effects of LGG. Health claims by Valio Ltd. were submitted in 2008 based on Article 13(5)[8] of the Regulation, referring to a probiotic LGG MAX for the reduction of gastro-intestinal discomfort by means of mixtures of strains of bacteria (among others, Lactobacillus rhamnosus GG). The claims with respect to two of the mixtures of bacteria strains were rejected by EFSA, due to the lack of valid scientific evidence on a cause-and-effect relationship (doi:10.2903/j.efsa.2008.853). In 2011, the EFSA-panel again rejected a similar health claim with respect to *Lactobacillus rhamnosus* GG (LGG), and its proclaimed defence against pathogenic gastrointestinal micro-organisms. The scientific evidence that Valio Ltd. provided did not sufficiently characterise the food for a scientific assessment of this claimed effect and the claim could therefore not be substantiated (EFSA Journal 2011; 9(6): 2167). No 'lactobaccillus'-claims have been validated yet at the time of writing.

Some proposed claims meet difficulties in the authorisation procedure despite the fact that convincing scientific evidence is available. For instance caffeine, chocolates or red wine [9] may have positive effects on health, but positive claims may be considered inappropriate because of other negative (social) side-effects.

From the experience of having a claim accepted or rejected, a learning effect will occur at the FBOs. Strategic responses to the CR-requirements will differ depending on the specific situation an FBO is in, the perceived strategic options, and their feasibility. The main strategic options are addressed in the next section.

[5]In case a product can be classified as 'food' as well as 'medicine' the classification as medicine has legally the advantage.

[6]Data provided by DG Sanco via B. Mathioudakis, workshop EFFL, Brussels, 11 April 2013.

[7]Data obtained from the Head of DG Sanco B. Mathioudakis in a seminar held on 11th April 2013 at the Club of the University Foundation (Brussels), organized by Lexxion Legal Publishers, Berlin/Brussels.

[8]Supplement to the list of claims (Article 13(2) of the Regulation) on the basis of 'newly developed scientific evidence'.

[9]Alcoholic beverages containing > 1.2% alc./vol. are forbidden to carry any claims.

Strategic options

Companies can respond in different ways to the CR-requirements. The options are among other:

- do not apply for a claim;
- do not innovate;
- circumvent the authorisation procedure.

Do not apply

If the probabilities and the effects of claims being accepted (or not) could be assessed with certainty in advance, companies could weigh the favourable and/or unfavourable effects of a claims application. An application will be more profitable if the claim is reserved to a single company and others are excluded. Often, claims are attractive in connection to newly developed ('novel') foods. Newly developed foods have to be submitted to pre-market approval procedures for novel foods/GMO-foods[10], next to the authorisation of proposed claims. The chance of success of an innovation is influenced not only by the claim that can be connected to it, but also by the admittance of a novel food to the market. Even if a claim is authorised, its use is not without risk. The wording of a claim has to equate to the authorised text; however, the exact wording that the Commission has accepted does not have to be used[11]. Using the 'official' wording is often unattractive for marketing reasons, as it might contain scientific expressions that the 'average consumer' does not understand[12]. For marketing purposes, therefore, understandable language is preferred. However, the limits to flexibility in wording might easily be surpassed. The respective products would then be labelled wrongly, have to be relabelled or taken off the market altogether.

Do not innovate

Due to a lack of resources and capabilities, SMEs are hindered in their innovation efforts, or might not innovate at all. Once they have entered into the authorisation process, FBOs can be 'locked-in': opting out is no longer wise because of positive future net cash flows, while an overall loss on the total project is already certain due to past negative cash flows. This strategic side-effect is surprising: the aim of European authorities was to *stimulate* innovation through the CR, not to create barriers to innovation.

Circumvent the authorisation procedure

The CR can be circumvented by choosing marketing texts which promote sales without suggesting the reduction of a disease risk factor, for instance by substituting a health claim with a nutrition claim or using a 'hidden claim'' message represented in an alternative text[13].

Conclusions, discussion and way forward

For FBOs, consumers and public authorities, the CR brings uncertainties with it. FBOs have to deal with limited predictability as to whether a claim will be authorised. Even after acceptance, the challenge remains as to how to design a text that on the one hand meets the mandatory legal requirements and on the other hand has enough marketing potential to be able to recover the R&D expenditures and regulatory burdens. For consumers, it may not immediately be clear what a claim means. For instance, he/she may grasp the general notion of relatively low energy-levels contained in a product called "light", but how this is measured goes beyond the knowledge of the 'average consumer'[14]. Also, the average consumer is barely aware of the scientific evidence underlying claim and novel food applications (Frewer *et al.* 2011) or of the efforts made and criteria used by public authorities to make the industry comply. For public authorities, it is difficult to assess whether a given piece of food information stays within the boundaries of the CR. While European food law should bring clarity and uniformity with respect to rights and obligations and serve common goals (free exchange of goods, facilitating informed choices by consumers, and provision of safe foods) the lack of quality within the food law itself as an institutionalised system of rights and obligations jeopardises the attainment of its own goal from the start.

A scientific agenda of tasks can be defined with the aim of improving the legal system, especially the claims regime. In retrospect, an investigation could be made on the stakeholder pressures which were at the source of the present legal system, as it impedes the competitiveness of the industry. Special attention should be paid to the adverse effects of premarket approval on the FBO innovativeness and access to the market. One of the goals of the CR was to create a 'level playing field'. SMEs (the majority of the European food industry by far) lack the financial means and capabilities to successfully engage in novel foods and/or claims authorisation procedures. However, they are the motors of the European food industry (see for instance Wijnands *et al.,* 2007; Poppe *et al.,* 2009). In retrospect, lessons can be learned from the hormone and GMO-disputes at the international level between the EU and

[10]Novel Foods Regulation (EC) 258/97. Novel foods are foods and food ingredients that have not been used for human consumption to a significant degree in the EU before 15 May 1997. If 'substantial equivalence' exists with present foods, a simplified authorization procedure is applied. Gmo-foods are included in different regulations and are only authorised after a full procedure (see Regulations 1829/1830/1831/2003).

[11]Some countries, like the Netherlands and Belgium, have developed guidelines in this respect. Possibly other countries will do the same exercise, with a different outcome.

[12]For instance a health claim related to eicosapentanoic acid (EPA): "reduces the AA/EPA ratio in blood. A high AA/EPA level is a risk factor in the development of attention difficulties in children with ADHD-like symptoms". EFSA Journal 2013;11(4):3161 [10 pp.]. doi:10.2903/j.efsa.2013.3161.

[13]Like 'one glass a day is as important as a glass of milk'; similar as in the "Monsterbacke" case, 5 Dec. 2012 C I ZR 36711 (Source: presentation A. Meisterernst, Brussels, April 2013).

[14]This is a legal category. On the basis of product liability case law, it is a consumer that is 'reasonably circumspect, taking into account social, cultural and linguistic factors' (among other: Case C210-96 Gut Springenheide). See also Directive 2005/29/EC concerning unfair business-to-consumer commercial practices in the internal market.

US, as pre-market approvals might be considered barriers to trade (especially if human health is not at stake and precautionary measures are therefore questionable; see in this context: Bremmers *et al.,* 2011). Last, uncertainties connected to the CR show that legal structure and logic have an impact on business strategies and compliance, as well as to legal content. The CR and related legislation does not meet basic principles of unambiguity, completeness, clearness or coherence. An overhaul of the nutrition and health claims requirements is therefore necessary.

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ARGUMENTS FOR THE OPTIMISATION OF USING BIOMASS FOR ENERGY PRODUCTION

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Abstract: Using biomass to produce energy is not a new idea. In the past, the by-products of energy(?) production processes or naturally grown materials were mainly used for energy production. At the same time, during the production of biomass the conventional sources of energy are used (fuels, the embodied energy of which is used in the production of the biomass and equipment, etc.) which must be taken into account when determining the net energy production. This research aims to examine how to optimise the production and use of biomass energy and its supply chain in the energetic and economic criteria system, as well as how to impact upon the managing models of the processes to the energetic and economic parameters of the supply chain; we ask what criteria characterise the natural (environmental), economic and social sustainability, and how they can be implemented e.g. within the framework of an innovation cluster. This article describes a test model, and analyses the results of the model examinations and the conditions for compliance with sustainability criteria. *Arguing the environmental, economic and social sustainability among the criteria of the model for evaluation is not possible at all times by means of direct indicators. The results of the research proved that only multi-criteria optimisation models serve a proper decision-making instrument for the evaluation of biomass utilisation for energy production.*

Key words: sustainability, logistics, heating energy, local society, cluster

Introduction

Research on utilising biomass for energy purposes can be traced back over many decades in Hungary, as well as internationally. Back in the 1980s, the research focused primarily on the by-products of crop production (see for example Lehoczki, Takács 1981 and Lehoczki, Takács 1983, where the economic evaluation of field trials with KTB-R straw bale combustion equipment is introduced). Later in the 1990s, the researchers' attention was mainly directed towards the different crops grown for energy purposes and the technologies suitable for their utilisation (bioethanol, biodiesel production, ligneous and non-ligneous fuels). Nowadays, quite a few papers examine the relations between the use of biomass for energy purposes at settlement level and sustainability under Hungarian conditions. (Szemmelweisz, n. a.; Eco Cortex, 2010; Bai, 2012)

The demand for sustainable development has been intensifying. The complex criteria of sustainability imply the necessity of multi-criteria argumentation regarding the problem, thus supporting the selection of optimal decision alternatives. Furthermore, the strategic planning of biomass energy production and utilisation in regional relations is important, too. Italian scientists have developed a GIS-based Environmental Decision Support System (EDSS) to define planning and management strategies for the optimal logistics for energy production from woody biomass, such as forest biomass, agricultural scraps, industrial and urban untreated wood residues. (Frombo et al., 2009) Other researchers have also focused on the sustainable utilisation of renewable energy sources and highlight the importance of common thinking among the stakeholders. (Georgescu-Roegen; 1979; Erős and Bíró, 2010; Popp and Potori, 2011; Dombi et al., 2012)

The regularly examined criteria may actually include the fulfilment of criteria of environmental, economic and social sustainability, while a simultaneous examination is not made explicitly. The argumentation for natural sustainability can be made directly (for example energy balance (return) or aggregated CO^2 emission, or indirectly (e.g. by minimising the environmental burden (?) of transportation). The argumentation for social sustainability can be made, for example, by citing the impacts on employment, evaluating the performance of organisational structures and the analysis of impacts on instrument efficiency and capital investment needs (how many and what types of instruments are required to solve the task).

The examination of the questions includes the following aspects of sporadically emerging biomass which can be used for energy purposes:

- designating transportation areas,
- selecting the optimal site of the plant (power plant),

- evaluation of energy payback ratio and the impact on aggregated CO^2 emission, and
- analysing the economic impacts of organisational solutions required for efficient implementation.

The following indicators can be used for the evaluation of the above listed criteria:

- net transportation cost,
- energy balance,
- aggregated CO^2 emission,
- net returns on investment.

Main considerations concerning the components of the criteria set

Optimisation of logistics costs

The qualities of the growing site of biomass (or the site of production in case of by-products and waste) are known and include:

- geographical location of individual producers
- distance between production points and biomass utilising points
- quantity of biomass produced on the growing site
- energy-equivalent of biomass produced on the growing site
- the expected changes of quantity and energy-equivalence on the growing site during the project term
- average cost of transportation between production points and biomass utilising points

The proximity of raw materials, transportation infrastructure with the aim of minimising transportation costs, infrastructure supply, environmental aspects and marketing/utilisation aspects of the produced energy determines the placement of the energy-producing plant (power plant).

The most widely used methods to minimise logistical distance and transportation costs include the least square method and the weighted least square method. The question can be posed from a reverse standpoint, too, by asking where the geographical limits (in terms of transportation district) of an efficient supply would be for existing biomass power plants.

Borjesson [1996] examined not only biomass production and its energy balance, but also the energy use for biomass transportation by different vehicles in Sweden. He concluded that Salix chips can be transported by truck for about 250 km before the transportation energy is equal to the production energy.

Other authors examined the environmental impacts of biomass energy production and utilisation, and highlighted the complexity of the question. Among the environmental impacts, they mentioned the utilisation of nutrient stock: the biomass energy may be 'carbon neutral' but this does not mean that it is ,nutrient neutral. (Abbasi and Abbasi, 2010). They also gave an important role to the question of limited land and water, soil erosion and water run-off, nutrient removal and losses, loss of natural biota, habitats and wildlife. Among the social and economic impacts, they mention shifts in employment and increases in occupational health and safety problems. It is expected that the total employment will increase, but on the other hand, the energy inherent in grain is of much higher benefit to humans when the grain is directly consumed as food instead of being used as a biofuel feedstock.

Returns on energy

Energy use and the returns on the utilised energy are calculated by applying the concept of material flow models. The concept of material flow models (Figure 1) is described by the balance equations of raw material mining/production-processing-utilisation-losses.

The energy flow or Sankey diagram offers some more possibilities to demonstrate energy flow. This demonstration model describes the distribution of the whole energy quantity. The analysis of the flow of available energy is made with energy flow or Grossmann diagram. (Wikipedia: Matthew Henry Phineas Riall Sankey, 2012)

This principle is also true for energy flow, but the quantity of energy utilised from the environment (in this study it is mostly solar energy) has a substantial share in the production of utilisable energy mass. At the same time, however, a considerable amount of energy is connected to the process of production, including both hidden energy (energy embodied in tools used for production taken in by materials used and energy utilised during production) and open energy (taken into process with fuels during the production). These tools transfer not only their economic value (see amortisation) to the products through multiple production cycles but also the energy required for their creation.

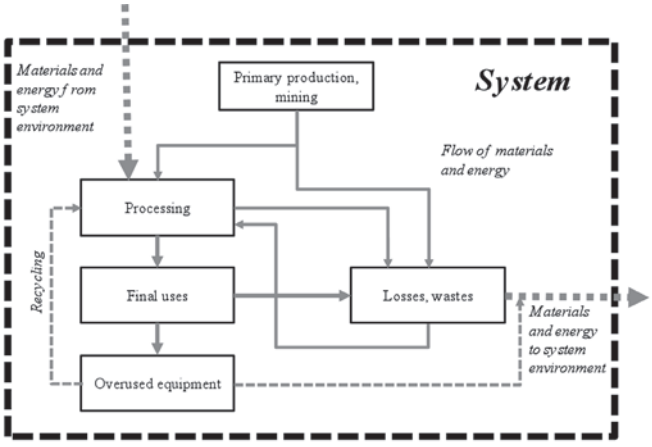

Figure 1. Model of material or energy flow
Source: own edition

Thus, from the aspect of energy payback we measure the extent to which the direct and indirect fossil-based energy input is paid off in the energy units produced by the system during its lifespan. In order to measure this, the so-called EPR Energy Payback Ratio was elaborated, which uses life cycle analysis to examine the relation between total net energy output and total energy input. (White and Kulcinski, 2000).

The estimation of the energy footprint, that is the embodied energy, is a modern approach to measuring energy efficiency with the help of which we can gain a real picture about the usefulness of different solutions aiming at energy savings. It is approached through the Leontief model called Input-Output Embodied Energy Analysis, an adaptation of the neoclassical general balance theory. (Leontief, 1966) (See furthermore Wikipedia: Embodied energy, 2012) As regards the practical implementation/applicability of the model those research projects and examinations have substantial role which try to determine the energy-equivalent of different materials and means. Table 1 presents the energy and CO^2 equivalent data of some typical materials and equipment.

The competitiveness of biomass is obvious primarily compared to oil- and coal-based energy production, and as such, their replacement with biomass is to be considered / can be considered.

Table 1. Embodied energy content of materials and equipment

Name of material	Energy	Coal	Density
	MJ/kg	kg CO_2/kg	kg/m^3
Brick (common)	3	0.24	1700
Concrete blocks (medium density)	0.67	0.073	1450
Cement mortar (1:3)	1.33	0.208	
Steel (standard, average recycled content)	20.1	1.37	7800
Wood (general, square-edged)	10	0.72	480–720
Aluminium (overall, 33% recycled ratio)	155	8.24	2700
Bitumen (general)	51	0.38–0.43	
Glass	15	0.85	2500
PVC (general)	77.2	28.1	1380

Source: Hammond, Jones 2008, Wikipedia: Embodied energy, 2012.

Material and methods

The examination model is a multifactor comparative method in which the logistic costs, energy payback, CO^2 load and economic returns are evaluated in parallel; the optimum is given by the version where the factors are most balanced.

Dimensions of the model:

1. Net transportation (logistic) cost
2. Energy balance (EPR)
3. Aggregated CO^2 emission
4. Net returns on investment (NPV)

Optimisation criteria: the area covered by the triangle or square made by the standardised values of criteria should be the maximum on the three- and four-dimension ray diagram.

Steps of optimisation:

1. Preparing the tables with the basic data
2. Preparing the parameters for the alternatives
3. Calculating the values of dimension variables per alternative
4. Standardising output values
5. Calculation of aggregated criterion value
6. Evaluation of results

Optimisation is made for the shortest transportation distance and the lowest transportation cost by using the least-squares method. Optimisation can be made on the basis of several considerations. If the biomass quantities produced are dispersed evenly, it is sufficient to optimise only on the basis of the transportation distance. If, however, the quantity of biomass is both spatially and temporally uneven and can be forecasted, and moreover the logistic costs also vary in the different transportation relationships, the optimum weighted transportation distance can be determined.

The basic data and the methods for estimating the processes were described in our former studies. (Takács-György and Takács, 2013) The optimum, on the basis of material quantities changing during the lifespan (without considering the costs), was set up on the basis of the least average distance weighted by the transportation quantity with the following equation. The determination of the optimum can also be made in those cases when biomass is collected in smaller local depots and is then shipped to the power plant.

The energy payback ratio (EPR) is determined by the analysis of project life cycle, by comparing the utilisable/utilised energy produced during the lifespan (*Y)* and the quantity of directly or indirectly utilised energy. It is calculated in the following way:

1. estimation of quantity of utilisable energy produced during the lifespan of the project
2. estimation of energy (size of energy footprint) utilised directly (fuels) or indirectly (embodied) during the whole duration of the project in the following cases:
   - 2.1. invested equipment which fully or partly serves the purposes of the project objectives and partly only
   - 2.2. estimation of energy value of fuels used during the lifespan of the project
   - 2.3. usage-based energy equivalent of infrastructure used in connection with project operation
   - 2.4. usage-based energy equivalent of ensuring subsistence needs of the labour force required for the operation of the project
   - 2.5. estimation of energy required for the liquidation of the project at the end of the lifespan.

The net energy that is produced during the lifespan of the project by operating the project can be estimated on the basis of the planned energy production (energy content of raw material input, energy footprint, energy equivalent of operation). Finally, the energy payback can be estimated.

Estimation of energy payback:

$$EPR=EiNEiE+EiO+EiR$$

where: *EPR is the* energy payback ratio for the lifespan of the project (–)

ENi is the estimated value of net (utilisable) energy in case of *i* project alternative during the lifespan of the project (J), depending on quantity of electric energy and quantity of heat energy that can be sold in case of *i* project alternative in *y* year; quantity of energy em-

bodied in materials that can be sold in case of *i* project alternative in *y* year
EEi is the estimated value of energy embodied in the equipment of *i* project alternative during the lifespan of the project (J)
EOi is the embodied energy equivalent of materials, energy, live labour subsistence used in the operation *i* project alternative during the lifespan of the project (J)
ERi is the estimated energy equivalent of restoring in case of *i* project alternative at the end of the lifespan (J)

It should be noted that the organisation model should be considered in the scheduling of technological equipment purchase and planning the amount of equipment required. The effect of consequent excess equipment need should be calculated in the embodied energy quantity. The adjustment factor – in case of usual conditions – can change between 1.5–3 (the nominal capacity is 90% compared to standard exploitation in case of 30–60% exploitation levels).

The estimation of present value created during the project's lifespan requires the planning of cash flow, based on the well-known NPV calculation. This calculation is made with well-known relations, as is therefore not described here.

The determination of aggregated CO^2 emission – similarly to the process used in the case of energy and economic payback – is made by the analysis of project lifecycle, by determining the CO^2 equivalent embodied in equipment and tools produced or directly used during the lifespan (*Y*). The optimum (?) is the maximum area covered by the standardised values of four evaluation criteria. In order to ensure comparability of results, the order of axes is fixed in a clockwise direction: (1) standardised logistic costs, (2) energy payback, (3) aggregated CO^2 emission, and (4) index of income during lifespan. (Figure 2)

It is at the optimum when the area bounded by the standardised values of the four criteria is maximal. The calculation of the area of the rectangle is made by the use of the areas of the right triangles forming it.

Table 2. General characteristics of scenarios

Code of the scenario	Characteristics of the basic material supplying district	Characteristics of machinery	Organisational characteristics	Order	
				4D	3D
A	The sampling district covers the geographic area modelled, road networks density is balanced.	Modern machinery with average utilisation.	Occasional cooperation, not coordinated decision making	2	3
B	The sampling district goes beyond the geographic area modelled, road networks density is favourable.	Modern machinery with above-average utilisation.	Cooperating participants, coordinated decision making mechanisms	1	2
C	The sampling district is smaller than the geographic area modelled, road networks density is not balanced.	Machinery of low performance with above-average utilisation and significantly extra capacity.	Not cooperating participants, weak machinery performance, not coordinated decision making	5	5
D	The sampling district is smaller than the geographic area modelled, road networks density is not balanced.	Modern machinery of high performance with below the average utilisation and extra capacity.	Not cooperating participants, weak machinery performance, not coordinated decision making	4	4
E	The sampling district goes beyond the geographic area modelled, road networks density is favourable.	Old fashioned machinery of low performance with above-average utilisation and above-average environmental pollution.	Cooperating participants, coordinated decision making mechanisms	3	1

Source: own construction

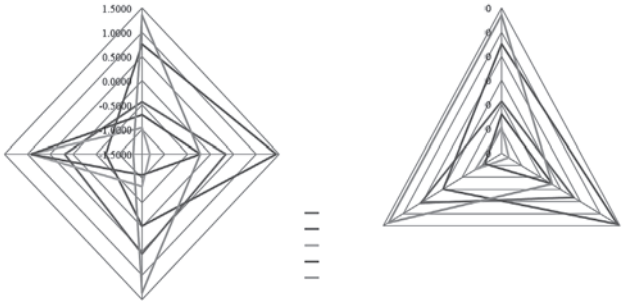

Figure 2. The polygon areas „stretched" by criteria variables on three- and four-dimension ray diagrams
Source: own edition

Results and discussion

5 possible scenarios (Table 2) were outlined for testing the model. These are evaluated with the help of input data based on expert estimations.

After the standardisation of criteria values of scenarios and, calculating the criteria, (Table 3, Figure 2) the received index values were suitable for sorting out the alternatives. Omitting the aggregated CO^2 emission from the criteria has rearranged the rank of scenarios.

It is clear, however, that the three-dimension analysis also provides enough information to drop the most unfavourable scenarios, the consequence of which is that the preparation works can be reduced by a two-stage examination consisting of a pre-screening and the values of the fourth dimension are developed only for a narrow group of alternatives.

Table 3. Comparing scenarios with the help of the model

Scenario	Standardised values of criteria variables	Area covered by the standardised values of indices	Order					
	SDÁT	-SDEPR	SDNPV	-SDCO2	4D	3D	4D	3D
A	-0.4310	0.3303	0.5521	0.1795	3.4030	1.9253	2	3
B	0.7543	1.4313	-0.0162	-0.7179	4.6567	4.1007	1	2
C	-0.9698	-1.3212	-0.8281	0.9273	0.2732	0.0000	5	5
D	-0.7004	-0.2202	-1.0717	0.9273	0.4505	0.1284	4	4
E	1.3469	-0.2202	1.3640	-1.3162	2.6161	4.7091	3	1

Note: 4D = average shipping distance, EPR, NPV, aggregated CO2; 3D = average shipping distance, EPR, NPV

Source: own edition

Conclusions

The complexity of economic and social processes requires a complex approach in the course of evaluation. Argumentation for environmental, economic and social sustainability among the criteria of evaluation models is not always possible with the help of direct indicators, and those indices should and must therefore be selected by considering the essential relations of process factors which are suitable for the numerical expression, description or estimation of observations.

This research focuses on the use of biomass for energy production purposes thus creating utilisable energy. On the other hand, however, the realisation of the process directly or indirectly absorbs energy (see embodied energy) as well as having some external environmental effects (heat emission, CO^2 emission) which are also unfavourable.

Obtaining the input is not only a question of logistics, but also affects the volume of the two factors outlined above (energy embodied in equipment and infrastructure used, CO^2 emission connected with shipping distance, etc.)

It should also be highlighted that the efficiency of production and the level of cooperation which also characterises the quality of social relations concerning the sustainability, affect the energy payback and the volume of externalities: a higher level of organisation and more efficient use of equipment can improve energy payback and decrease environmental loads.

Supplementing the traditional economic payback with criteria displaying the requirement of sustainability indicates a more long-sighted way of thinking and also supports well-founded decision-making.

Acknowledgement

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RECENT TRENDS IN THE CROATIAN AGRICULTURAL BUSINESS SECTOR

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Abstract: The purpose of this paper is to explore recent trends in the Croatian agriculture and forestry business sector and compare it with the Croatian economy as a whole. This topic is considered interesting because recent business years have been heavily influenced by the global financial crisis. Many authors would say that agriculture, as a specific branch of the economy, does not follow general trends, but is affected rather by other factors, especially such as environmental ones. The global financial crisis had the most negative impact on the Croatian economy in the 2008/2009 period, when the GDP growth rate tumbled from 2.4% to -5.8%. Although some positive movements have been recorded since 2009, a recession is still going on. Based on information from the National Financial Agency (FINA) database we found that during the period 2007-2011, agricultural firms experienced the same trends as the whole economy, except in terms of average monthly salaries and employment. However, due to the impact of / on? agricultural products prices and yields, in two year period from 2008 to 2010, agricultural firms recorded an almost linear fall in revenues, while the national business sector on the whole experienced a sharp fall in revenues in 2009 and then only a modest fall in 2010.

Key words: agriculture, financial crisis, revenues, efficiency ratios

Introduction

The first impacts of the financial crisis were registered in the United States of America (USA) in 2007. The crisis emerged because of a huge increase of securitised lending, which caused a strong increase in the housing market. Securitisation lenders, originating from many countries besides the USA, invested in the USA housing market because the prices were on a long-term high . At the same time, lending institutions in the USA loosened their requirements for the backing-up of credits. Finally, when USA housing prices declined, major global financial institutions that had invested heavily in asset-backed securities reported significant losses. The shock that affected the USA financial sector in 2007 appeared in Western Europe almost simultaneously, while it did not affect Eastern Europe until 2008 (Yifu Lin and Martin 2010; Swinen and Van Herck 2010).

According to several authors, the global financial crisis did not affect the agricultural sector in the same way as other sectors of the economy. For the USA's farming sector, the impact of the crisis has been alleviated by the strong financial position of the majority of the farms (Ahrendsen 2012). Farmers usually borrow from smaller, local institutions which have not been involved in investments on the housing market (Boehlje and Hurt 2008). There are also many evidences that the agricultural sector is a bit more "recession-proof" than the economy in general, since its output prices are influenced by a number of factors besides a recession. In addition, for some of the agricultural products, the supply is much more important in determining price variations than are movements on financial markets. Ultimately, long-term prices and the weather are the most influential factors on the supply side of agriculture (Good and Irwin 2008, Matthews 2011). This is true for some of the most important crops such as maize, soy beans, wheat and rice.

The Croatian economy moved into crisis in 2009 after a long period of continuous growth. A sharp decline in GDP as well as in the growth rate clearly shows the effect of the crisis (Figure 1).

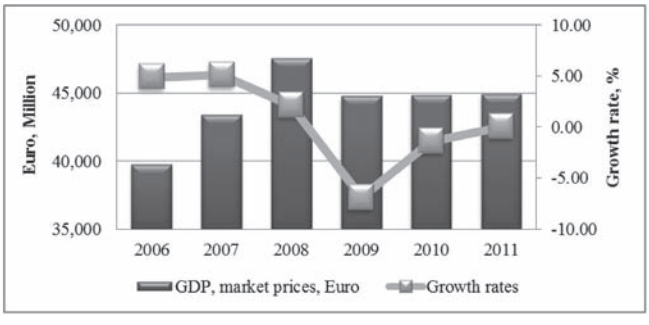

Figure 1. Gross Domestic Product and its growth rate in Croatia
Source: According to data from Statistical Yearbook of Croatia, Central Bureau of Statistics, Zagreb

As well as the decline in GDP, the Croatian economy also experienced all the other effects of the global crisis, and it is still in recession with no sign of recovery. In the years

after 2009, interest rates increased, businesses, households and government debts grew and unemployment soared to a very high level. However, the Croatian government did not take any serious measures to ease the negative impacts on the economy. The Croatian National Bank continued to manage a firm monetary policy of preservation of the national currency Kuna (HRK), with some interventions in the banking sector to provide additional financial resources. Also, a new tax was introduced to cover the rising budget deficit.

According to the financial data provided by FINA, business entities in Croatia grew in number from 2002 to 2007. Today, the Croatian private sector is still heavily influenced by the destructive impact of the global financial crisis. Because of these negative developments, the business sector needs additional resources to finance its activities and its indebtedness increases. Lenders are still willing to lend, but interest rates are higher than they used to be before the crisis. Also, the quality of bank sector placements has deteriorated. For example, the share of partly and fully irrecoverable bank loans to business enterprises in terms of the total value of loans has increased from 7.3 to 20.1 per cent.

Agriculture, including forestry and fishery, constitutes around 5% of the total gross value added in Croatia. Statistics are usually given according to National Classification of Activities (2007) and data for agriculture only are not available. Therefore in this paper we use data for sector of Agriculture, Forestry and Fishery to represent the situation and trends in agriculture. We view this as an acceptable compromise since forestry and fishery are of marginal importance in the sector compared to agriculture.

Agricultural businesses cannot avoid the negative impact of the global financial crisis which has hit the Croatian economy. However, as has been stated by the above mentioned authors, it is possible that the crisis has affected agriculture in a different way than other sectors. To ascertain whether differences in development trends between the agricultural sector and the Croatian economy as a whole really exist, the available statistics for the period 2006-2011 have been analysed.

Materials and methods

This paper is based on two main sources of data:

1. The Analysis of Financial Results of Entrepreneurs in the Republic of Croatia published annually by the national financial agency of Croatia - FINA.
2. The set of financial data for agricultural business entities in Croatia provided by the private financial consultancy firm Boniteti Ltd.

The FINA has the most comprehensive financial database for the Croatian firms since all national business entities are required to send their financial statements to FINA regularly. The second, Boniteti Ltd., provides financial consultancy based on the FINA data set and some additional data sources.

The data set used for this research includes aggregated financial information for agricultural business entities as defined by the National Classification of Activities, version 2007, which is comparable to the international classification of activities NACE Rev. 2.

General economic indicators are taken from official publications and bulletins of the Croatian National Bank, and the Croatian Bureau of Statistics.

The methods used for data description and analyses are:

- Graphic presentations
- Descriptive statistics methods
- Indices
- Financial ratio analysis
- Linear correlation.

The series of comparable data are currently only available for 5 to 6 years, and the results of correlation and trend analyses cannot be taken as representative. However, they can serve as rough estimates of development trends for chosen variables.

Results and discussions

The total number of enterprises in Croatia has been growing for 10 years between 2002 and 2011. This is also the case with the number of enterprises in the agricultural sector, except for 2010 when this number temporarily decreased before rising again in 2011. According to the available data, 98,530 enterprises submitted their financial reports to FINA in 2011. Of this number, 3,085 subjects were registered in the Agriculture, Forestry and Fishery sector, the vast majority of them being agricultural firms.

The number of people employed at business entities was growing until the effects of financial crisis pushed the economy down. The highest employment rate was achieved in 2009, with some 934,000 employees in total in all enterprises, and around 36,000 in agricultural businesses (Figure 2).

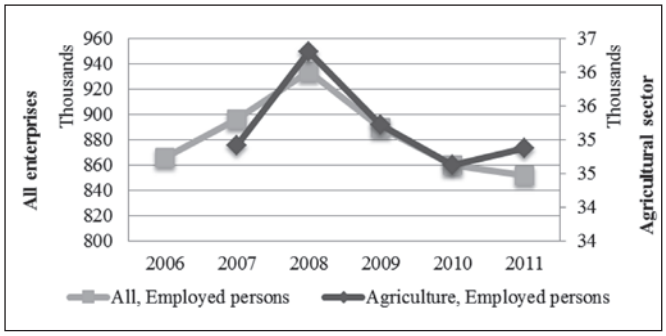

Figure 2. Employed persons at business entities in Croatia
Source: Based on FINA and Boniteti Ltd. data sets. Zagreb. 2008–2012
Note: Comparable data for agricultural sector are not available for 2006.

Agricultural businesses' total assets varied from HRK 27.3 million in 2007 to HRK 38.7 million in 2011. In that period, the total assets decreased only in 2010, while the average total assets per business entity were down for two consecutive years: 2009 and 2010 (approximate currency rate: € 1.0 = HRK 7.5).

If we recall the above described trend in number of entities, it is obvious that in 2009, agricultural enterprises experienced the toughest business year. Their balance sheets went down

mainly because of the decline in current assets, perhaps because they had to write off large amounts of *doubtful accounts receivable.*

Aggregate financial performance of agricultural business entities

The total revenues of all businesses entities registered at FINA gives a clear picture of the impact of the global financial crisis on Croatian enterprises. In two consecutive years, 2009 and 2010, aggregate total revenues dropped by almost HRK 112 billion, or –15%, compared to 2008 (Figure 3). At the same time, the decrease in the total revenues of agricultural businesses was even larger in relative terms: from HRK 26 billion to HRK 21 billion.

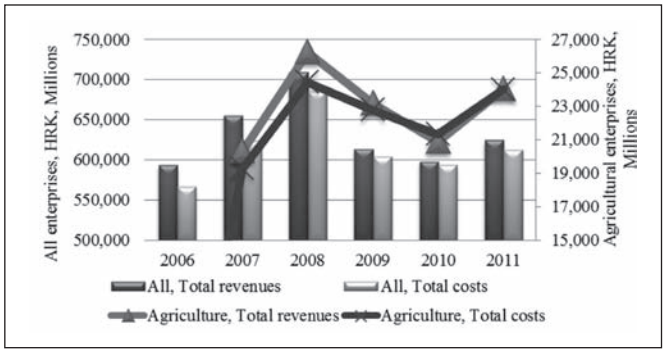

Figure 3. Total revenues and costs of all enterprises and of agricultural enterprises in Croatia
Source: Same as Figure 2.

In Figure 3, we can see that the agricultural sector registered almost the same relative decrease of revenues in 2009 and 2010, while the business sector as a whole dropped much less in 2010. The agricultural sector showed an even negative profit in 2010 when total costs stayed above the decreased revenues. However, figures started to recover after 2010. The highest total revenues achieved in 2008 are due to the positive trends of two factors: (1) a higher price index of agricultural products compared to 2007 and (2) a favourable production year and good harvest of the most important crops in 2008. In 2009, both prices and yields decreased, and this development augmented the negative all-embracing impact of the global financial crisis. We should be aware that since 2008, the gap between price indices of agricultural products and agricultural inputs has widened. The average value of price indices of current inputs for agriculture is 125, while the average of price indices of agricultural products is 109.

The key business performance ratios are in line with the total values of revenues and costs. The net profit margin of the whole business sector started to fall in 2008 (Figure 4) because the increase in revenues, compared to 2007, was relatively smaller compared to costs. In 2008, because of favourable price conditions and high production, the ratios in the agricultural business sector were better than for the business sector as a whole. However, soon after in 2009, negative trends hit agricultural businesses severely; since then, its results have stayed behind the results of the overall business sector.

The deterioration of business results due to the crisis has brought problems of liquidity as an unavoidable result. The self-financing ratio (equity to asset ratio) of the whole business sector started to fall in 2006 and reached its lowest level in 2011 (Figure 5).

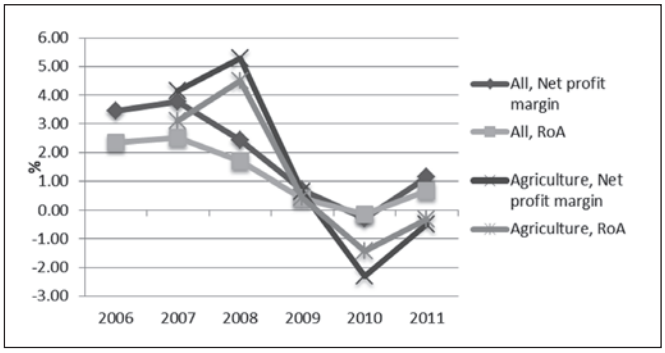

Figure 4. Net profit margin and rate of return on assets (RoA): All sectors and agricultural sector
Source: Same as Figure 2.

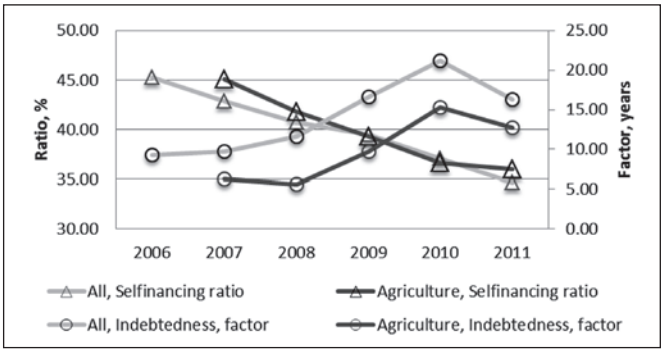

Figure 5. Self-financing and indebtedness of all businesses and agricultural businesses
Source: Same as Figure 2.

The indebtedness factor (liabilities or debts divided by the money available for repayment) was stable until 2008, and then started to grow until 2010 (Figure 5), indicating a longer period for servicing debts and more problems therein.

Bank loans to business entities grew in value over the whole period, while interest rates rose until 2009. In 2010 and 2011, interest rates decreased to a level which is still above the 2006 level. The liquidity ratios of the whole business sector started to worsen from 2007 until 2010. The liquidity ratios of agricultural firms have become lower on average and more volatile over the years. Agriculture especially has a lower quick ratio with an average of 0.68 over 5 years, while the overall average is 0.79.

Agricultural business results and the financial crisis

So far, the review of the available data sets showed that agricultural businesses experienced the same general trends as the entire business sector in Croatia. However, the degree of annual change of total revenues in agriculture was quite

different. In the 2007/2008 period the total revenues in agriculture grew more than the entire business sector, and then in 2008/2009 they fell less in comparative terms. In 2010, the total revenues of agricultural firms then declined more than for the entire business sector, and finally in 2011, the relative increase of total revenues was larger in the agricultural sector. The discrepancies described show that the global financial crisis is not the only factor which has influenced agricultural business and its results.

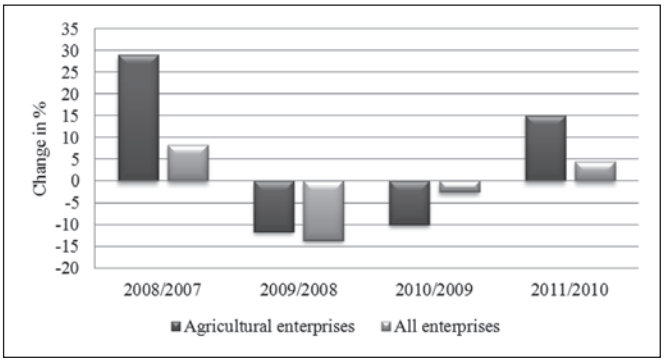

Figure 6. Relative annual change in total revenues
Source: Same as Figure 2.

The most obvious impact factor is sale revenue, since we found that these make 95–96% of total revenues in the agricultural sector. Knowing that the total revenue is a product of price and quantity we have observed the trends of these two variables (Figure 7).

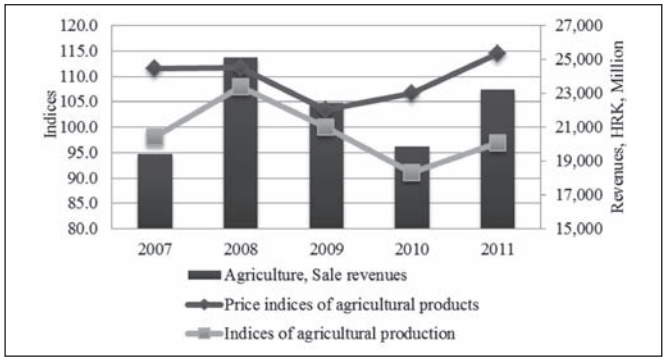

Figure 7. Sale revenues of agricultural firms, price indices and agricultural production indices
Source: Same as Figure 2.

Figure 7 provides an insight into the causes of decline in the sale revenues of agricultural firms. Since the sale revenue bars follow the production indices curve more closely, we can say that yield is a more important factor in influencing revenues than are the prices of agricultural goods. Hence, although the price indices curve increased in 2010, due to the lower production level, the revenues continued to fall in the same year.

Using data from Figure 3 and Figure 7, we can also observe that total revenues in agriculture were falling annually at a similar rate from 2008 to 2010, while the entire business sector experienced (1) a sharp fall from 2008 to 2009 and then (2) a slower fall from 2009 to 2010 (Figure 3). It seems that revenues in the agricultural sector were protected in 2009 from the destiny of the entire business sector by satisfying production volumes. However, in 2010, agricultural firms experienced worse production results and consequently, their revenues dropped more than for the entire business sector. The connection between total revenues and indices of agricultural production can also be seen in the value of Pearson's correlation coefficient, r=0,79 (which for crop production is even higher: r=0,80).

The results of the research allow us to accept the conclusions of other authors who have found that the performance of the agricultural sector in crisis is not necessarily in line with the entire economy (Ahrendsen 2012, Matthews 2011). In fact, it is very much influenced by yields and prices of agricultural products (Good and Irwin 2008, Matthews 2011). These other factors besides a financial crisis can cause the agricultural sector to perform better or worse compared to other sectors in crisis conditions. In case of the Croatian agricultural sector, it is important to stress that it cannot influence its output prices, especially for the most strongly represented products (corn, wheat and milk). The prices are taken from either the world or the regional market. Hence, in case of high yields in Croatia, the prices will not necessarily fall and decrease potential growth in revenues.

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EUROPEAN CYCLE TOURISM: A TOOL FOR SUSTAINABLE REGIONAL RURAL DEVELOPMENT

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**corresponding author*

Abstract: We present an economic impacts model based on direct expenditures for European cycle routes, originally designed in 2009 as part of a study commissioned by the European Parliament. At its request, the study was updated in 2012, including a refined version of our model which takes some limitations of the former model into account. Our main findings are that cycle tourists' daily spending is comparable to that of other tourists, and that cycle tourism can contribute significantly in particular to rural economies that have not previously enjoyed mainstream tourism development. (European) cycle tourism thus proves to be useful as an (additional) tool for regional rural development. We arrived at a total estimated direct expenditures in Europe of almost €44 billion (€35 billion from day trips and €8.94 billion from overnight trips). We applied the model to the routes of EuroVelo, the European cycle route network which is currently being developed, showing their considerable economic potential of over €7 billion in direct expenditures. Furthermore, cycle tourism has a far lower negative impact on the environment (in terms of carbon dioxide emissions) than other forms of tourism. Cycle tourism is therefore a good example of a low carbon tourism product which could be developed as a major slow travel opportunity across (rural) Europe.

Key words: cycle tourism, tourism transport, economic impacts, sustainable tourism development, regional rural development

1. Introduction

In 2009, we co-authored a research report on European cycle tourism for the European Parliament (Lumsdon *et al.* 2009), the findings of which were summarised and updated in Eijgelaar *et al.* 2011a and 2011b. At the request of the European Parliament we updated the report in 2012 (Weston *et al.* 2012). Among others, both reports provided estimations as to the volume and (monetary) value of the cycle tourism market across Europe and sought to evaluate the potential for further development.

The economic significance of several existing European cycle routes was estimated using a newly developed (Lumsdon *et al.* 2009) and further refined (Weston *et al.* 2012) Cycle Route Demand Forecast Model (CRDFM). We also looked at the potential economic benefits of envisaged European cycle route networks.

This paper starts by summarising the most important updated findings with regard to the European cycle tourism market. The refined model is then presented, including suggestions for further improvements. The Eurovelo European cycle route network is used as case study. The sustainability of cycle tourism is then briefly touched upon before the conclusion, in which the usefulness of (European) cycle tourism as a tool for regional rural development is assessed.

2. Materials and methods

2.1. European cycle tourism market: Number of cycle holidays and day trips

Both EP studies distinguish between cycle holidays and cycle day trips. In the absence of data on the demand for cycle tourism across countries, we reviewed reports from countries where studies have been undertaken. An analysis of this material provides an overview of the demand for cycle tourism across Europe. This generalised approach is possible because cycle tourists have very similar characteristics across most countries. However, we did apply differences which affect the propensity to cycle in everyday life and to choose cycling as part of a holiday.

Within the context of the overall outbound market, cycle tourism remains small-scale in Europe, the focus lying with domestic markets. The marginal growth of cycle tourism, both in terms of provision and market demand, is uneven across Europe. In countries such as Austria and France cycle tourism is still growing, while in other countries, such as Denmark, Germany, Switzerland and The Netherlands it may have reached saturation.

Lumsdon *et al.* (2009) and Weston *et al.* 2012 did not present a forecast of the demand for European cycle tourism based on data which is readily available in every country, but rather a less accurate estimate based on incomplete and scattered data. Our model uses fractions of existing tourism flows within Europe (EU27 plus Norway and Switzerland). Tourism departure data has been related to population size per country (Eurostat 2008) assuming a certain number of trips per capita for every country, as well as to adapted domestic and international tourism flows taken from earlier work by Peeters et al. (2004).

In the 2009 EP study (Lumsdon *et al.* 2009), it was estimated that there were 2.795 billion cycle tourism trips in Europe per annum. One of the key points of criticism of these estimates was that they sometimes differed considerably from the figures in national studies (Krieger and Baum 2011). For the 2012 update, the method and estimates for European cycle tourism have been revised.

As with the 2009 study, countries were divided into three bands of high, medium and low demand. In order to overcome some of the perceived deficiencies of the 2009 estimates, two changes have been made. Firstly, three new bands were added to the levels of demand, giving six in total, ranging from low to very high. This increases the sensitivity to national variations in demand. The second improvement was to link the banding of countries to the general use of bicycles as a mode of transport for each country (The Gallup Organisation 2011), rather than being based solely on expert opinion (Lumsdon *et al* 2009). The results are shown in Table 1.

Factors were generated from collected cycle tourism data and allocated to each of these bands. These were then applied to overall tourism demand to generate an estimated demand for cycle tourism in each country. This resulted in 2.295 billion cycle tourism trips (2.274 billion day trips and 20.36 million overnight trips) per annum in Europe (EU27 plus Norway and Switzerland).

2.2. European cycle tourism market: Direct expenditures

One important aspect of cycle route development is the way in which direct spending in local economies can generate businesses and create and/or maintain jobs. This is particularly important in mostly rural areas which are not tourist 'honey pot' sites and would not be able to attract visitor spending otherwise.

We needed data on average individual tourist expenditures to estimate the economic impacts of cycle tourism. Since almost all the available research is based on tourist questionnaires we needed to limit our calculations to *direct* tourist expenditures. Additional indirect and induced effects are not taken into account.

The Swiss Veloland cycle network has been monitored extensively from the projects' inception, and its use has been high since its early stages of development. The total number of cyclists per annum was 3.4 million in 1999 and rose to 5 million in 2009 (Utiger and Richardson 2000; Utiger and Rikus 2010). After a temporary decline to 4.4 million in 2010, the total volume returned to 5 million in 2011 (Utiger and Rikus 2012). Total expenditures in 2011 were estimated at €118 million. On average, overnight holiday cyclists (staying more than 2 nights) spend €71 per day, of which €28 is on accommodation, and €25 on food and beverage (Ickert *et al.* 2005; Utiger and Ickert 2005).

A review of the available data on levels of expenditure across a number of other regional and national studies in Europe further illustrates this difference between cycle tourists and day cycle excursionists. We used those studies providing cyclist volumes, average length of stay and daily spending to calculate a trip-excursion weighted average. It should be stressed that these studies are, to a large extent, incomparable due to the different methods and samples used. Nevertheless, the similarities of nearly all overnight (between €50 and €70

Table 1. Cycle tourism demand bands. Source: Weston et al. 2012: p.35

Demand band	Low	Low-Medium	Medium	Medium-High	High	Very high
Share of population using cycling as main mode of transport (The Gallup Organisation, 2011)	≤2%	>2–5%	>5 –<8%	8–12%	12–20%	>20%
Expert estimate share of cycle holidays as % of all holidays	0.5%	1%	1.5%	2%	3%	3.7%
Countries attributed to demand band	Turkey**/*** Bulgaria Luxembourg Portugal Malta** Cyprus Spain	Romania Lithuania Serbia**/*** Norway*** Croatia**/*** Macedonia**/*** Italy Estonia Ireland Greece UK	Latvia Czech R. Slovenia France*	Slovakia Poland	Hungary Denmark Sweden Belgium Germany Finland Austria* Switzerland*/***	Nether-lands

* Austria, Switzerland and France have been moved up one demand band in order to compensate for a lower daily usage share of cycling with demonstrated high shares of incoming cycle tourists . **These countries could not be included in the estimate for Europe due to missing background data. ***These countries do not feature in the modal split data of The Gallup Organisation (2011). They have been attributed a 'cycling as main transport mode' share based on other, similar data on bicycle usage and the shares of neighbouring countries.

per day) and day excursion spending figures (between €10 and €20) are evident. Evidence from one cycle route (Elbe Saxony-Anhalt) points towards a relatively constant daily spending level over the years (2004–2011; Peters 2012). Table 2 gives a detailed look at the resulting average direct expenditures per type and activity.

Table 2. Average direct expenditures per type and per activity
Source: Weston *et al.* 2012

Expenditures per day and per trip overnight cycle tourists incl. accommodation	€57.08 per day €439 per trip (average length of stay: 7.7 days)
Distribution over different activities of overnight cycle tourists	€23 Accommodation (40%) €17 Food and Beverage (F&B) (30%) €17 Other (30%)
Expenditures day excursion cyclists	€15.39 of which 60–75% on F&B

Together with the estimated annual 2.295 billion cycle tourism trips (2.274 billion day trips and 20.36 million overnight trips) in Europe (EU27 plus Norway and Switzerland), we arrived at estimated direct cycle expenditures in Europe of almost €44 billion (€35 billion from day trips and €8.94 billion from overnight trips).

2.3. The Cycle Route Demand Forecast Model (CRDFM)

For the 2009 EP report by Lumsdon *et al.* (2009), the Cycle Route Demand Forecast Model (CRDFM) was designed to generate estimates per year of the number of cycle holiday trips, day trips and direct expenditures of these visits on a particular cycle route, per region and in total. It is geographically based and the input required is the code of each NUTS 3 region[1] the cycle route passes through and the distance of the route within these regions.

From the publicly available data sources on cycle tourism in Europe as discussed and analysed in Lumsdon *et al.* (2009), we developed an approach for modelling demand and expenditures. The model was updated in Weston *et al.* (2012) from its original 2009 version including new study results. National figures on cycling as a main mode of transport (The Gallup Organisation 2011; See also Table1) were added and multiplied with population density as an extra determining factor in order to arrive at better estimates of day trip volumes.

For cycle holidays or overnight trips:

- trips/km = f(tourism beds/km^2) and direct expenditures = f(€ per trip)

Cycle day trips:

- trips/km (Lumdson *et al* 2009) = f(population/km^2)
- trips/km (Weston *et al* 2012) = f(% population with bicycle as main mode x population/km^2)
- direct expenditures = f(€ per trip)

These relations turned out to be the most significant from a multitude of variables such as GDP/km^2, population/km^2, daily modal split, nights/km^2 and beds/route-km.

For holidays, the number of trips per route kilometre per year is 30.91 times the number of beds (all accommodation types) per square kilometre of the NUTS 3 region through which the route passes or within which the network is situated.

For day excursions, the number of trips per kilometre per year is 24.9 times the number of people per square kilometre of the NUTS 3 region multiplied by the (national) share of the population that uses cycling as their main mode of transport in the area through which the route runs or within which the network lies at the NUTS 3 level.

Despite the refinements there are still several limitations. It has higher relevance for rural areas and for those Western European countries that provided input for the model (particularly Germany, Switzerland, Austria, and the Netherlands). It can be assumed that the average direct cycle expenditures in (most of) the Central and Eastern European countries will be (much) lower due to (much) lower costs and consumer prices for accommodation, F&B, and so on. Møller Munch (2009) showed that daily spending by cycle tourists can also vary per country of origin. The availability and density of various products for cycle tourists in a region (gastronomy, local products, shopping, and so on) also determine the amounts they (can/will) spend to a large extent (Mercat 2009; Quack and Hallerbach 2012). The use of direct expenditures fails to take into account indirect and induced economic effects and ignores expenditures leaking out of the local/regional economy. In reality, trip numbers do not suddenly change drastically at district borders. Therefore, the overall figures are likely to be more realistic than those at the NUTS 3 level. To conclude, the model also fails to differentiate between target markets and neglects the influence of marketing.

3. Results and Discussion

3.1. Case Study: EuroVelo network

The EuroVelo Trans-European Network comprises of fourteen long distance cycle routes covering a distance of 70,000 km, of which approximately 45,000 km are in existence at the moment (ECF 2013). A completed EuroVelo network could potentially result in over €7 billion of direct expenditures: 14.5 million holidaymakers (111.65 million holiday cycle days) with total direct expenditures of €6.38 billion and 45.54 million day trips with €0.70 billion of direct expenditures.

As EuroVelo makes use of existing routes, this value only represents the direct expenditures, not the net additional economic impacts of the EuroVelo concept itself. These depend on the way the concept impacts on development in relation to missing stretches and by adding marketing value. There is also the consideration of the multiplier effect in each locality, bringing additional indirect and induced expenditure especially in places where local supply chains and local businesses are well developed and properly interlinked.

[1]NUTS (Nomenclature of territorial units for statistics) regions are defined by EuroStat. NUTS 3 is the most detailed level for socio-economic analyses, as small regions for specific diagnoses (see http://epp.eurostat.ec.europa.eu/portal/page/portal/nuts_nomenclature/introduction).

It should be stressed once again that the projections given by the model are for 'good to ideal' circumstances with an adequate and regular supply of facilities such as cafés, restaurants, shops, and so on. If these are absent or intermittent, the average spending figures used cannot be reached. Two studies in France (Bourgogne Tourisme 2010 and Mercat 2009) for example noted that a large percentage of day excursionists spent hardly anything (the average daily direct expenditures for all day excursionists were €0.24 and €1.00 respectively). The share of those not spending was much higher than reported for Germany and Switzerland, apparently due to a low supply of 'spending facilities' (Bourgogne Tourisme 2010).

3.2. Sustainability

Particularly for the tourism sector, a broader sustainability-oriented context is relevant, as this is one sector where CO_2 emissions have been and are expected to rise steadily (Scott *et al.* 2010). Emissions are largely produced during origin-destination transport and mostly caused by cars and aircraft. Overnight cycle tourists use the train far more often and the car and plane much less often than average tourists do. Also, their average return distances are shorter, resulting in considerably fewer emissions. Accommodation emissions are also lower as they stay less in hotels, this being the accommodation type with the highest emissions per guest night. German cycle tourists, for example, produce 66% fewer holiday emissions per trip than the average German holidaymaker (Lumsdon *et al.* 2009). The carbon footprint (CO_2 emissions) of domestic cycle holidays in the Netherlands is 35% smaller than average, which is considerable in regard to the short transport distances for both cyclists and average tourists (de Bruijn *et al.* 2011). As a result of these low emissions and average daily spending, the eco-efficiency (a measure for comparing expenditures with CO_2 emissions) of cycle tourism is nearly always higher than for holidays made by cars or by aircraft.

3.3. Conclusions: European cycle tourism, a tool for sustainable regional rural development

For local and regional tourist boards and other planners of new cycle routes, we presented a model to allow estimates of demand and direct expenditures generated by (European) cycle routes. The model has been calibrated mainly on Western European cycle routes because of a lack of studies into other cycle tourism areas.

There are still a number of barriers to the development of sustainable European cycle tourism. Carrying a bicycle by rail is relatively inexpensive, but not always possible and in most cases not easy. Carrying a bicycle on an aeroplane is always possible, requires some mechanical changes and a cover, but is relatively expensive compared to rail. The solution here might be that rail increases the price of carriage and invests these extra revenues in making it more convenient to travel with a bicycle. Another barrier is the lack of quality of long distance routes and networks in many, mainly non-Western European, countries. Thirdly, in general terms, tour operators and other tourism providers show low involvement in the development of cycle tourism.

The evidence assessed in the EP studies and this paper indicates that cycle tourists bring major (additional) benefits to localities which do not currently enjoy mainstream tourism development. These results convinced the EP of the (monetary) value of cycle tourism. At the end of December 2012, the EP decided to incorporate cycling, tourism and the EuroVelo infrastructure into the approved TEN-T network with the future possibility of (additional) EU funding (ECF 2012). The development of routes is relatively low cost, re-using disused assets such as canal towpaths, old railway tracks, or shared road space on (high)ways where traffic levels are generally low. Finally, it has the advantage of being a sustainable, low-carbon form of tourism which could be developed as a major slow travel opportunity across (rural) Europe.

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RURAL RESILIENCE AND THE ROLE OF SOCIAL CAPITAL AMONG FARMERS IN KIRUNDO PROVINCE, NORTHERN BURUNDI

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Abstract: In Burundi, more than 90% of the active population is engaged in family agriculture, which plays a vital role in food production and constitutes more than 50% of the GDP. Before the civil war of 1993, Kirundo was deemed the "breadbasket of the country", as the region fed many parts of Burundi through growing particular foods such as legumes and cereals. Family farming was market-oriented. Kirundo alone includes 8 lakes which offer opportunities for field irrigation. Today, this region is the first province in Burundi which shows a high rate of malnutrition, as poverty has increased and a sharp 53.9 % decline in agricultural production has been witnessed between 1996 and 2009. The aim of this article is to analyse the role of social capital through the local association network in improving family agriculture and the resilience to climate change and conflict crisis. In this study, 73 farmers were surveyed in Kirundo province through means of a questionnaire, and the study was completed by collecting secondary data. Analysis of the data reveals that, despite recurrent droughts in that region which caused deaths due to famines and displacement of people to neighbouring countries such as Rwanda and Tanzania, 44% of the farmers who were surveyed were shown to have resilience to climate change. The analysis of data shows that these farmers were members of well organised local associations, and had learned about specific topics such as financial management, processing and storage of agricultural products and livestock. The social capital network positively influences their income and their resilience to climate change and conflict crisis.

Key words: Rural resilience, social capital, family agriculture, Kirundo Province, Burundi

1. Introduction

In the course of the last century, the number of local associations in Burundi has continued to grow worldwide and their nature and functions have continued to evolve. In Kirundo Province, most local associations have been formed as a response to the various crises brought by drought and cyclical famines in that region. Social networks are therefore of value (Putnam 2000), as they are the very basis of all social interactions and transactions, an idea that is captured by the term "social capital". The concept can be roughly defined as "institutions, relationships, attitudes, and values that govern interactions among people and contribute to economic and social development" (Grootaert and Van Bastelaer 2002). Furthermore, Rose (2000) defines social capital as follows: "Social capital consists of informal social networks and formal organizations used by individuals and households to produce goods and services for their own consumption, exchange or sale". In general, informal social networks comprise face-to-face relationships between a limited number of individuals who know each other and are bound together by kinship, friendship, or propinquity. Informal networks are 'institutions' in the sociological sense of having patterned and recurring interaction. However, they lack legal recognition, employed staff, written rules and own funds. In general, they are not formally structured as there is no principal but rather a platform for agents to exchange information, goods and services. On the other hand, formal organisations are legally registered, and hence have a legal personality. They are rule-bound and have to follow formal procedures in their management. In general, they have a secured annual budget which might be made up by its members, the market and / or the state. A formal organisation's membership can be made up of individuals and/or other organisations. In this respect,

an organisation is a corporate actor who, as a principal, co-ordinates its agents activities and benefits from the activities of the agents (Rose 2000).

The early work of Putnam *et al.* (1993) on the relationship between social capital and the functioning of regional governments in Italy is perhaps the most well-known and influential contribution to the discussion about the relationship between social capital and economic growth. The main finding of the authors is that regionally dispersed patterns of association membership, trust, and cooperation, form an important tool of facilitation for governance efficacy and economic prosperity. The Italian study was based on two decades of empirical data collection, in order to find explanations for the different functioning of regional governments in northern and southern Italy, and economic differences between the regions. As resilient communities can better cope with shocks, sudden change will not disrupt their development as much as in less resilient ones. Hence, development in communities that are characterised, amongst other things, by high levels of bridging social capital, and thus higher resilience, is likely to be more sustainable than in communities with lower levels of (social) resilience. Thus, DFID (2011) defines resilience as "the ability of countries, communities, and households to manage change, by maintaining or transforming living standards in the face of shocks or stresses, such as earthquakes, drought, and violent conflict without compromising their long-term prospects".

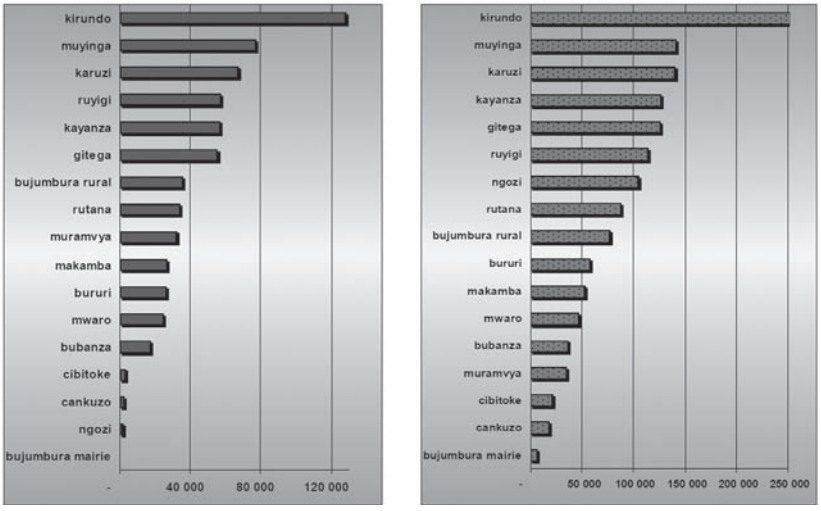

Figure 1. Provincial distribution of slices of the poorest population in Burundi
Source: (IMF 2010)

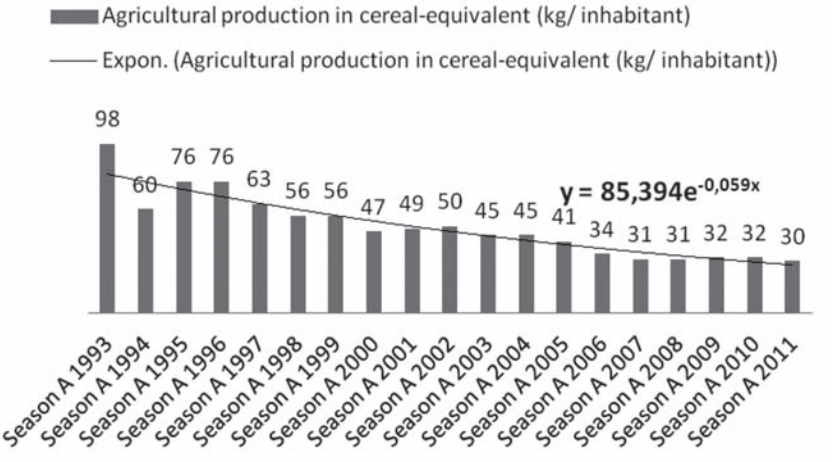

Figure 2. Agricultural production in cereal-equivalent (kg/inhabitant) from 1993 to 2011
Source: Author's calculations from data from Burundi Agriculture and Livestock Ministry

Before the civil war of 1993, agricultural production was sufficient to ensure food security for Burundi's population. Agriculture, livestock and more generally the development of rural areas play a vital role in any strategy to reduce poverty. Indeed, 90% of Burundi's population and 69% of the country's poor live and work in rural areas (figure 1). In those areas, food production is insufficient to ensure the food security of rural populations and malnutrition rates are particularly high (IMF 2010, p.16).

Burundi agricultural production declines (figure 2) from 98 kg of cereal-equivalent per inhabitant harvested in season A of 1993 to 30 kg of cereal-equivalent per inhabitant in season A of 2011, while the annual demographic rate is growing to 2.4 % (MININTER 2011). During the civil war from 1993 to 2005, many socio-economic infrastructures were destroyed and the well-being of the population has declined, the GDP per capita having dropped from $250 per capita before the civil war (1993) to $110 per capita in 2010 (IMF, 2010). Many people therefore live in food insecurity and a high rate of malnutrition exists for children under 5 years.

The main objective of this study is to analyse the role of social capital through the local association network in improving family agriculture and resilience to the climate change and conflict crisis

Through this study, we will compare three groups: (i) Group A with members in well organised local associations which are registered by the government and have experimented with training in a variety of different sectors (economy, agronomy, environment, etc.); (ii) Group B, whose members are part of local associations which are registered by the government, but are poorly organised, have undertaken little or no experimentation with trainings, and have a rather opportunist character when they see funders, and, (iii) Group C, those farmers who are not members of any local association and do not receive any help from financial institution.

2. Area description and methods

2.1. Area description

Kirundo Province is one of the 17 provinces of Burundi, and is located in the Northern Burundi. Kirundo Province has a surface area of 1703.34 km², with a population of 628256 inhabitants (UNDP 2005, p.14). The province is divided into 7 communes (Bugabira, Busoni, Bwambarangwe, Gitobe, Kirundo, Ntega and Vumbi).

Kirundo Province is bordered by Rwanda to the North, Ngozi Province to the South and Muyinga Province to the East. This is a province that straddles two natural regions, Bugesera and Bweru. Bugesera region includes the municipalities of Busoni, Kirundo Bugabira, Ntega and much of Bwambarangwe and Gitobe. It is a region with a very long dry season, with rainfall between 800 and 1200 mm. Bweru region meanwhile includes communes Vumbi, Southern Gitobe and a small party of Bwambarangwe. It is watered with rainfall exceeding 1200 mm. Kirundo province has over 5 lakes (Rweru, Rwihinda, Cohoha, Kanzigiri, Gacamirindi, etc.) which cover an area of 16, 000 ha. Many wetlands, mostly undeveloped, are occupied by rice cultivation. Since the year 2000, agricultural activities have often been paralysed by prolonged drought. The consequences of that situation are a continuous reduction in production and a population struck by famine. To remedy this, many stakeholders, NGOs, projects and local state structures are trying to help people through the financial or technical support such as improved seeds, mineral fertilisers, training in new agricultural techniques, etc which boost agricultural production and rural economy. This intervention approach has led many people to create local associations, most of them being opportunistic with the immediate aim of receiving available funding but sometimes lacking the organisation with which to create a sustainable network.

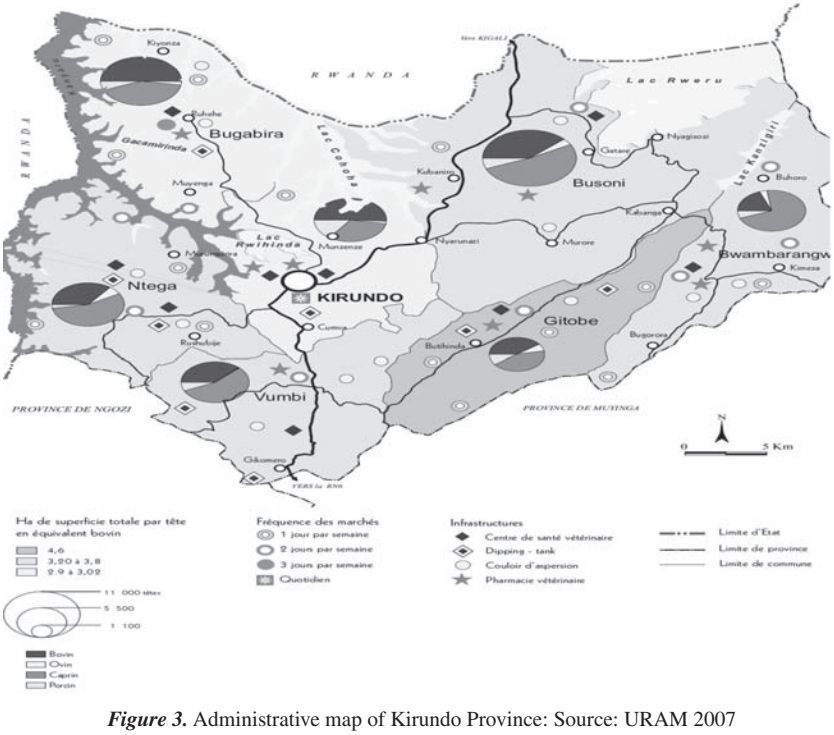

Figure 3. Administrative map of Kirundo Province: Source: URAM 2007

2.2. Methodology

An exploratory survey was conducted in 2010 among 355 farmers who were heads of households, randomly selected in seven communes of Kirundo; 50, 75, 30, 40, 55, 55 and 50 farmers were selected respectively from the communes of Bugabira, Busoni, Bwambarangwe, Gitobe, Kirundo Ntega and Vumbi. This sample was stratified and weighted by the number of agricultural farmers living in each municipality.

According to this survey, a comprehensive study was conducted with 73 farmers in 2011-2012, in order to find out why some farmers are resilient to shocks arising through climate changes and conflict crisis in this province and thus escape famine, and also enjoy high agricultural productivity compared to other farmers. The questionnaire survey technique was used. This study led us to subdivide farmers into three main groups:

Group A represents 32 farmers grouped in different local associations with long experience in the field; they are well organised and have received much training from national or international organisations, have experience in fields including agriculture, livestock, trade, financial management and crafts sectors and have cooperated with other national or international organisations.

Group B includes 15 farmers who are members of various associations, but they are young and inexperienced in the field, poorly organised and have not received training in the various sectors mentioned above, or have not yet received support from donors;

Group C accounts for the 26 farmers who did not work with any local association or have not received training from donors or other national or international organisations.

The research was completed through reference to literature related to the themes which developed. We used SPSS 16.0 to analyse our data, and analysed many parameters including the number of agricultural workers per household, the number of livestock per household, fertilisation, the consumption-sales ratio, agricultural productivity per farm assets, etc.

3. Results and discussion

The results in table 1 show that the farmers from group A have a high level of education compared to other farmers, 59% among them having completed primary school, while 13% completed high school, and the other 28% can at least read and write the local language (Kirundi), no farmer in the group being

illiterate; meanwhile, the farmers from groups B and C include many people who are illiterate: 47 % and 39 % respectively in groups B and C. The illiterate farmers develop a sense of inferiority compared to other farmers who can read or write at least the local language and they frequently differ from others by not joining local associations or participating in training organised by their associations or by donors, especially when this training requires taking notes. It seems that education can improve productivity directly by the quality of work done, by the ability to adapt to change, and by encouraging a state of mind conducive to the adoption of technical and organisational innovations. The development of literacy and numeracy skills can help such farmers to collect and analyse internal and external information on their operations, develop the ability to anticipate necessary, especially when radical changes, and heighten the awareness of the challenges and opportunities of production and non-agricultural activities. Therefore, the increase and development of human capital improve the technical and managerial practices of farmers and offer to them the chances of success (Barrett *et al* 2001).

Table 1. Level of education of farmers surveyed in Kirundo Province

Groups	Level education of farmers (%)				
	Primary	Secondary	Read and written Kirundi	Illiterate	Total
Group A	59	13	28	0	100
Group B	40	0	13	47	100
Group C	42	0	19	39	100

Source: Own survey 2011–2012

Analysis of data from the survey shows that a high percent of farmers for Group A (58%) fertilise crops compared to 20% of Group B and 22% of Group C. The high number of farmers in Group A who fertilise their crops is linked to modern farming techniques learned during the training received from national or international organisations and other inputs through support from donors. To have a positive impact on a highly visible field, donors required that farmers gather in associations. As we will see, these cooperative relationships that have developed between farmers grouped in associations permit a boost in crop production. To establish supportive relationships effectively, it is necessary that local networks are dense, as in this example, but also that external opportunities exist to provide the necessary incentive policies. These results are consistent with those found by Coleman (1988) and Fukuyama (1995), Cramb (2006) and Cramb (2007) who noticed that social capital played the core role in rural development. Farmers in Group A can fight more effectively against erosion than farmers in the other groups for three main reasons: (i) advanced knowledge on erosion control techniques, learned during internships and visits to other farmers, (ii) using the external labour wage in addition to family labour in order to protect the soil through agricultural techniques such as digging pits, planting hedges etc., and (iii) possessing many more cattle than farmers in groups B and C.

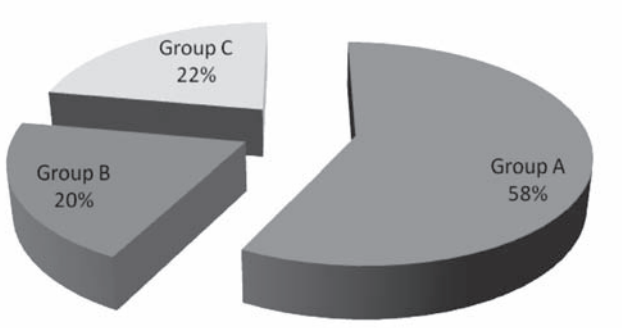

Figure 4: Fertilisation of crops
Source: Own survey 2011–2012

These results show that when the amount of labour and means of production included in each unit area begin to decrease (making the system less intensive), a downward trend in fertility occurs. This situation is observed in groups B and C, whose farmers experience lower agricultural productivity (Cochet 2001).

Table 2. Agricultural Productivity analysis by Farmer Assets (Kg/ farmer assets)

Crops	Mean (kg/ assets)		
	Group A	Group B	Group C
Bean	334,66**	81,15	94,42
Maize	313,58**	17,08	52,31
Cassava	435,14**	164,83	185,1
Banana	1328,5**	316,67	225,37
Sorghum	169,06*	71,67	85,67
Tropical Livestock Unit	2,49**	0,747	0,594

**: Highly significant
*: simple significant at $p<0.05$
Source: Own survey 2011–2012

On viewing these results, it is apparent that farmers in Group A are highly productive compared to farmers in Groups B and C, in terms of bean crops, maize, cassava, banana, sorghum and Unity Tropical livestock. This is explained by the fact that the farmers in Group A apply modern farming techniques learned during the training received through their local associations. In addition, technical and financial support received from donors has led to this high agricultural productivity (including mineral fertilisers, livestock through the chain of solidarity, improved seeds, etc.). Also, when farmers become members of active associations, it is easier to obtain agricultural credit and requires fewer conditions because their associations endorse them. The observations made in this study also confirm the study on commercial fishing industries in North Queensland, Australia, in which Marshall *et al.* (2007) base social resilience on four different pillars: (i) risk perception towards change, which depends on the alternatives people have in terms of the financial situation, and on the social capital they have at their disposal; (ii) human capital, whereby the more skills and experience people have, the less risk averse they are, and the better able to cope with

change; (iii) people's perception of their ability to cope with change (iv) the interest people have in actually adapting to change.

Table 3. Consumption-sales ratio of the main crops of Kirundo Province

Crops	Ratio=Consumption/ sales		
	Group A	Group B	Group C
Bean	2,3	0,4	0,3
Maize	6,1	0,1	0,3
Cassava	1,7	0,3	0,5
Banana	4,2	2,8	0,9
Sorghum	2,3	0,4	0,6

Source: Own survey 2011–2012

We note that the farmers who are members of active local associations display stronger performance in terms of agricultural productivity. These farmers orient their agriculture to the market while those farmers in groups B and C orient their production towards consumption. The explanation for this is that in group A, farmers receive agricultural credit more easily because of the guarantee offered by their associations ,allowing them to buy agricultural equipment etc., and can also apply new agricultural techniques learned in their local associations. Moreover, the fact of belonging to well organised local associations provides an active social capital and leads to a social resilience in raising agricultural production and economic development.

4. Conclusion

Social capital accessed through the network of well organised local associations allows significant improvement of the production systems and permits farmers to withstand, recover from, and reorganise in response to crises such as climatic disturbances or conflict crises; membership in poorly organised associations, on the other hand, has no significant influence on the well-being of farmers. This study thus leads us to conclude that the social capital gained through well organised associations boosts the socio-economic development of country, and the government is therefore advised to sustain and support the development of well organised local associations in order to raise the well-being of the population.

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USING SUSTAINABLE DEVELOPMENT TOOLS FOR SOLVING PROPERTY RIGHTS IN MONTENEGRO

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Abstract: In recent months Montenegro has been faced with serious budget problems , one proposed solution of which has been to reduce the number of employees in state administration. Additionally, the costs of living are above the disposable budget of most households, in particular the high cost of electricity. While the government warns about a lack of electricity, the citizens are hardly in the position to cover these costs. Montenegro is dealing with the double challenge of inefficient use of space (the country features over 100,000 illegal homes)*(I don't understand the link between inefficient use of space and illegal homes)* and inefficient energy use (Montenegro needs an average of 8.5 times more energy per unit produced than an average EU country).
How can these problems be solved in a way which pleases both sides?
In this paper, an approach is presented which links the solving of the problem of illegal construction with increasing the level of energy efficiency in households, businesses and other facilities. There is a model developed by UNDP Montenegro – an integrated policy solution to the double challenge of providing energy efficiency measures to incentivise households to legalise their homes. The legalisation of illegal buildings by the introduction of mandatory energy efficiency measures in them may at the same time result in an increase of revenue to the central and local budgets, the reduction of negative impacts on the environment, an increase in employment, the engagement of the economy, a reduction of electricity consumption and thereby to reduce the need to import electricity, and ultimately the increased welfare of the population.

Key words: energy efficiency, sustainable development, illegal construction, energy audits, retrofitting

Introduction

The world is currently experiencing three inter-related crises. The first is related to the trend of rising resource prices, the second to the global rise of inequality within countries, and the third is linked to the other two crises, as the world is at a tipping point with regard to the loss of vital ecosystem services and extreme events – both connected to the changing climate. The three crises are related, mutually reinforcing one another and creating a vicious cycle that impacts all segments of sustainable human development - economic competitiveness, social inclusion and environment. Any viable solution must match the complexity of the crises, addressing them in an integrated manner that will unleash economic growth and job creation, while at the same time conserving biodiversity and maintaining a balanced environment.

This paper will present one such integrated solution that aims to resolve the multi-dimensional development challenge of informal housing (connected to the issues of low economic empowerment, rising pressure on the environment, high exposure to extreme events, inefficient resource use, and low quality of life). It will demonstrate how UNDP plans to utilise the main principles of the green economy to provide economic empowerment to the citizens in Montenegro.

What is a Green Economy?

UNEP defines a green economy as one that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities. In its simplest expression, a green economy can be thought of as one which is low carbon, resource efficient and socially inclusive. In a green economy, growth in income and employment should be driven by public and private investments that reduce carbon emissions and pollution, enhance energy and resource efficiency, and prevent the loss of biodiversity and ecosystem services. These investments need to be catalysed and supported by targeted public expenditure, policy reforms and regulation changes.[1]

The development path should maintain, enhance and, where necessary, rebuild natural capital as a critical economic asset and as a source of public benefits, especially for poor people whose livelihoods and security depend on nature.

The last two years have seen the idea of a "green economy" float out of its specialist moorings in environmental economics and into the mainstream of policy discourse. It is

[1]UNEP, Towards a Green Economy, Pathways to Sustainable Development and Poverty Eradication, 2011

found increasingly in the words of heads of state and finance ministers, in the text of G20 communiqués, and discussed in the context of sustainable development and poverty eradication.

Energy efficiency

Humankind is facing one of the greatest challenges in its history: developing in order to "meet the needs of present generations without compromising the ability of future generations to meet their needs"[2]. Increasing demands for natural resources, the weakening of ecosystems, global warming and soaring population growth are just a few of the global issues confronting us. Since the end of the 1960s there have been more and more global initiatives to reduce social and ecological imbalances. The movement is now speeding up: those involved are becoming aware of the role they can play within their sphere of influence and of the interdependence between the various aspects of sustainable development.

Improving energy efficiency is connected primarily with buildings, both residential and business; the main challenge now is to design, build and renovate buildings to reduce their environmental impact and create spaces that are healthy and comfortable for the occupants. Throughout their life cycle, buildings consume natural resources, generate waste and emit large amounts of CO_2, contributing significantly to global warming. A large proportion of the world's population, particularly in the developed countries, spends 90% of its time indoors (source: OECD). In this context, questions of hygiene standards inside buildings and the comfort of occupants are also central issues in the debate.

Energy efficiency retrofits provide an opportunity to reduce greenhouse gas emissions, generate economic activity, save billions in energy costs, and ensure the long-term viability of affordable housing. However, there is insufficient data on how much energy these upgrades actually save, and therefore little data on what the return on investment would be for lenders. Without this data, it is very difficult to secure upfront capital investments in retrofits, inhibiting this sector's capacity to scale.

Montenegro's legalisation problem

Over the past decade, Montenegro has witnessed rapid urbanisation fuelled by foreign direct investment on the Adriatic coast and in mountain resorts. This growth, which has significantly increased the GDP of the country for several years has, in parallel, caused negative effects such as urban sprawl in previously natural landscapes along the coast and around the capital Podgorica, resulting in large numbers of informally built constructions (that is without a construction permit), both commercial and residential, that have very low energy efficiency characteristics. This results in an overall increase in CO_2 emissions due to rising energy demand in buildings. According to one estimate, there are approximately 100,000 such informal constructions, though there are no clear statistics.

Nearly all Montenegrin households (>99%) are connected to the electricity grid and metered. Based on the latest available data from 2001, the average monthly electricity consumption in Montenegro was 367 kWh per household. This means that the average monthly electricity bill per household amounts to around 100 Euros. According to the estimation of the Ministry of Economy of Montenegro, 80% of the electricity in the household is used for the heating. Most homes are heated through an electric radiator system, an electric thermal accumulator or an individual heating system. Wood is one of the most popular heating sources in individual houses in Montenegro, especially in the North, but is almost absent in the South and in apartment buildings.

In most cases, buildings constructed without building permits have not been subject to the process of verification of application of standards, neither in the course of design development nor during performance of works, particularly from the aspect of seismic risk.

In addition, Montenegro is faced with serious budget problems, the solution of which, among other things, is seen in reducing the salaries of employees through various instruments. On the other hand, the costs of living are significantly above the disposable budget of households. A particular problem is the high cost of electricity, which resulted last year in street protests by discontented citizens across (?) the country. Thus, on the one hand we have a government that alerts its citizens about a potential lack of electricity, and on the other hand we have citizens that are unable to cover these costs. Is there a feasible solution?

The UNDP office in Montenegro came up with the idea to link solving the big problems in Montenegro, such as the problem of illegal construction, with increasing the level of energy efficiency in households, businesses and other facilities. The UNDP proposes an integrated approach that includes an increase in the energy efficiency level of buildings and the use of financial resources made from savings in energy consumption to finance the legalisation process.

The UNDP approach to the legalisation problem

The formalisation of Montenegro's informal settlements represents a unique opportunity not only to insert EE considerations into the regulation of this building stock (for the first time ever), but also to integrate informal neighbourhoods and settlements into municipal governments' spatial planning in order to address urban-system GHG mitigation opportunities inside town areas.

At the beginning of 2011, the Ministry of Sustainable Development and Tourism of Montenegro and UNDP agreed on a joint implementation of three new pilot projects which deal with the problem of transforming informal settlements to formal ones. This is related to three municipalities, namely Zabljak, Bijelo Polje and Bar. The purpose of the energy audits was to determine a baseline for consumption and potential savings, giving the most basic renovation/retrofit measures. Every energy audit consisted of basic information

[2]Our Common Future, Brundtland Report, 1987

about the existing object, its current use, dimensions, number of inhabitants, heating periods during the day and the whole year, local climate characteristics etc.

The following most cost effective and most frequent basic EE measures have been suggested: **appropriate isolation of external walls; replacement of windows/ doors; roof insulation, floor insulation**. After a review of the conducted audits, a general conclusion was reached that on average, reconstruction (retrofitting) of illegal households in Montenegro could cut electricity consumption by 59%, which leads to a return period of less than 7 years.

In order to test the above estimations through demonstration, the UNDP team performed a prototype i.e. reconstruction of 4 illegal household facilities during 2012 in Bijelo Polje, measuring energy consumption before and after reconstruction.

Post reconstruction (retrofitting) audits showed even better results in relation to preliminary controls. Measurements conducted showed that energy savings vary from **50% to 82%** (**65% on average**), which means a period of return on investment from **5 to 6.3 years**.

This prototype showed that even implementing additional and relatively expensive measures such as the ***installation of a new central heating system***, which is not considered a measure which will improve EE performance, but will in general raise the level of comfort, is economically justified. In that case, the return on investment would be, in total, **7 years**.

Table 1. Basic prototype results

Savings in delivered energy	34763	kWh/god.
Net savings	767	€/year
Total investment (EE measures)	4,698	€
Return on investment	6,4	years

Source: UNDP estimate, prototype Resnik – Resovo, Bijelo Polje

Economic effects

The methodology used for calculation and analysis of EE measures and (word missing?) implementation in the formalisation process is based on putting forward a hypothesis, audit and data processing, the use of experiments in the economy, modelling and verification. The author further dwells on the general methodological procedures in economy, namely analytic, synthetic and historical methods, and macroeconomic and microeconomic analysis. The following hypothesis was put forward: *Can the implementation of EE measures on illegally constructed objects ensure the financial resources necessary for formalisation itself*?; the hypothesis is tested and approved by means of the above mentioned methods.

In order to test the hypothesis, an investigation (energy efficiency audits of illegally constructed buildings) was performed, as well as an experiment (prototype). Data obtained from the experiment were calculated and average values were determined (for a 100 m^2 building) and were transferred by linear extrapolation to the level of the entire economy and country (based on the assumption of the existence of 100,000 illegal buildings in Montenegro).

The basic results can be found below (experiment results –100 m^2house):

Energy audits of 34 objects (municipalities Bar, Bijelo Polje and Žabljak) showed that **average energy consumption** (electric energy, wood, and coal) amount to **57,416 KWh** annually, i.e. 63.619 KWh annually for a **100 m^2** household. **The average investment** needed for implementation of the stated measures is 4,698 Euro, i.e. **5,000 Euro** for a **100 m^2** building. In addition, an investment of 5.000 Euro creates **850 Euro of VAT**.

Savings in energy consumption that can be achieved through the above measures amount on average to 34.760 KWh annually or 767 Euro, i.e. for a **100 m^2 household to 37,900 KWh annually or 830 Euro. Thus, expressed in percentages, the average electrical energy saving is 63%.**

According to the records kept daily through the measurement book and reports of the supervision body, five workers were engaged in reconstruction every day (construction company); one employee was engaged for supervision works, and in the initial phase one employee for the development of project documents and another for the management of the entire process. In total, the **engagement of seven persons per object/building** is needed**.** Based on the obtained entry data, it is easy to calculate the **time period of return** on investment into retrofitting, which is on average **6.12 years**. In addition, EE measures can lead to a reduction of CO_2 emissions of **1000 kg** annually per **object**.

The presented data represent inputs for further analysis into the effects of EE measures implemented on illegally constructed objects in Montenegro, based on macro-economic indicators, and for determining the possibility to use financial means made through savings in energy consumption on micro and macro levels, for financing the legalisation process. If the obtained data are estimated for the entire economy, taking into account the assumption that the number of illegally constructed objects in Montenegro is 100,000, the following macroeconomic implications are obtained[3]:

Level of investments – retrofit of 100,000 buildings would create around 470 million Euro direct investments in the construction sector and provide work for the entire construction sector in the Montenegrin economy. Also, in an indirect manner, this level of investment would stimulate an increase of activities in other sectors and economic branches. At the annual level, **47 million Euro of direct investments** is expected, which is **around 14%** in relation to the current level of construction work in Montenegro**;**

[3]Note: with regard to the size of the objects, the assumption is that it is not realistic to expect that all objects are reconstructed in one year. We start from the assumption that this is a long-term process, and that 10,000 objects can be reconstructed annually. This assumption was taken into account when calculating the annual data.

Amount of revenues from VAT – the direct effect of retrofitting would reflect an increase of revenues from VAT in the total amount of around 80 million Euro, i.e. **8 million €** at the annual level, which would increase budget revenues from VAT by **2.5%** at the annual level **over the following 10 years**;

Employment – when calculating the level of employment we took into account two scenarios. One is based on the results of the prototype and its extrapolation on the total number of objects. The second scenario starts from the fact which is the result of numerous investigations that tried to calculate the number of new jobs created by investments into energy efficiency, according to which an investment of one million dollars creates 10 jobs. The total number of jobs created by reconstruction of 100,000 objects, according to the first scenario, is assessed at around **60,000**. However, a precise estimation of the number of employees cannot be made without information related to the dynamics of reconstructions, number of objects at the annual level, number of companies performing reconstructions, project development, energy audits, supervision and the like. Due to lack of adequate information, we used data from the second scenario, according to which, the total number of new jobs that can be created by the above legalisation process **amounts to 6,200,** reducing the number of unemployed by **13%;**

Reduction of energy consumption in Montenegro – retrofitting 100,000 objects would lead to a reduction in the total energy consumption by around **3,476 GWH** for a period of 10 years, i.e. **347 GWh** annually. This would have enormous positive effects on the already highly loaded energy network in Montenegro, i.e. it would reduce the need for the import of energy by **27%** annually *(is this what you mean?)*, and after less than 4 years it would entirely eliminate the need to import electric energy and create capacity for the export of energy in the following years.

In addition, observed in the period of 20 years, which is the period of repayment of compensation for legalisation, two scenarios were calculated in terms of electric energy consumption. The first **basic scenario** envisages energy consumption which is unchanged in relation to the present moment. **The second scenario** calculates consumption taking into account measures for **increasing energy efficiency**. Moreover, since the price of electric energy is expected to rise in the following period, a calculation (trend) of electric energy price was made for both scenarios for a period of 20 years. The annual growth rate of 2% was used in the calculation.[4]

The following results were obtained: according to the basic scenario, total consumption of an average 100 m^2 household over a period of 20 years will amount to 1,280 MWh, i.e. 46,359 Euro. On the other side, the scenario that envisages EE measures implementation shows that the total consumption of an average 100 m^2 household over a period of 20 years will amount to 500 MWh, i.e. 18,223 Euro, which is **2,5 times less in relation to the basic scenario**;

GDP – increased activity in the construction sector would have a direct effect on the increase of GDP of **1,5% annually**, over the following 10 years;

Amount of revenue from legalisation – the fee for legalisation varies depending on a number of factors, such as the town in which the object is located, the construction zone, urban or rural environment and the like. In the settlement Resnik-Rasovo, where the experiment was conducted, the legalisation fee is 20 Euro per square meter. However, in Podgorica and the seaside towns it is considerably higher, while in some of the northern municipalities it is even lower. That is why in our analysis we started from the assumption that legalisation cost is 50 Euro per square meter, and in compliance with the provisions of the new Law on Regularisation of Illegal Objects, it is envisaged that legalisation cost can be paid over a long time period (min. 20 years), in monthly instalments. Taking into account all the above, we come to the conclusion that local self-governments in Montenegro can collect a total of **500 million Euro** of revenues from legalisation over a period of 20 years, i.e. **25 million Euro annually** or slightly over **2 million Euro at the monthly level**, which is a considerable inflow for small municipal budgets. This would ensure the sustainability of local budgets in the long run.

Increase of ***revenues from property tax*** – due to the lack of an inventory of illegal objects which would provide information important for defining property tax rate (location, number of floors, floor area, use and the like) it is not possible to determine the amount of property tax that would be collected; however it is evident that 100,000 objects that make one half of the total number of registered households in Montenegro can generate considerable revenues for the Montenegrin budget.

Financial mechanisms

For the implementation of the presented model of legalisation, the answer to the following question must first of all be given: *In what manner can funds for the reconstruction of objects be secured?*

The following financial mechanisms can be recognised:

- *Commercial bank loans* – on the Montenegrin market there are loan arrangements for households and companies for investment into energy efficiency. Loans are given for a period of 7 years at the annual interest rate of 7%. This is the most unfavourable form of financial mechanism, but the expected level of savings would be sufficient to cover the monthly instalments of the loan.
- *Loans from international financial institutions* (EIB; EBRD and the like) – the given mechanism implies organisation of a state programme, similar to programmes implemented by the Government of Montenegro so far (such as Program 1000+ for example), which foresees the state taking loans from an international financial institution according to favourable credit conditions (low interest rate, grace period, adequate repayment term), which would be offered to owners of illegal objects through a network of

[4]Source: Annual Energy Outlook, with projection to 2035, U.S. Energy Information Administration (EIA), June 2012

commercial banks. Savings in energy consumption would be sufficient for covering the loan instalment and costs for legalisation.

- *Entry of the ESCO company* – ESCO – Energy Service Companies do business in the world acting both as investors and contractors of works for energy efficiency improvement. These companies perform energy audits, invest financial resources in reconstructions-retrofits and carry out reconstruction itself, perform control energy audits, and monitor consumption over the following several years; they charge object owners for their services over a number of years (most frequently 8 to 10) at the monthly level, at the amount of savings made in energy consumption (or up to 80% of savings made).
- Loans taken from the republican Investment-Development Fund – this option is similar to the option of taking out a loan, where the municipality/state could act as an ESCO company, which performs works, and collects its claims from savings made. For this option, the existing capacities can be used (e.g. Agency for Construction of Podgorica, and so on) which would gradually be increased and strengthened.

The approach to the implementation of energy efficiency measures in the legalisation process is shown in the table below, taking into account one of the possible scenarios, for an illegal object of 100m^2.

Household size	Monthly expenses for energy	Savings	Legalisation cost (50 € per m^2)	Reconstruction cost (i.r. of 4.5% for a loan of 5,000 €)
100 m^2	110 €	63%	5000 €	7600 €
After retrofitting				
	Cost for energy	Legalisation cost for 20 years	Retrofitting cost (20 years)	Total
Monthly	47.30 €	20.80 €	32.00 €	99.8 €

The calculation shows that after reconstruction, every household applying for legalisation will have reduced expenses in relation to what it pays for energy, with the expenses now including legalisation, energy consumption and reconstruction costs. This means that even with a smaller amount of money, now they will have a legal and energy efficient object which is more comfortable and safer for living.

Conclusion

This idea the potential of using energy efficiency as an incentive to owners of illegal objects to start the process of their formalisation.

The first testing of the idea was carried out by UNDP, by means of the prototype. It was proved that the idea is based on sound grounds and that there is great potential for its successful implementation. However, the central and local authorities are at the helm. Successful implementation is possible only if there is ownership of the idea and the entire approach by municipalities themselves, with support from the central level of decision making.

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EDUCATION FOR RURAL DEVELOPMENT AND AGRIBUSINESS IN POST-SOCIALIST SLOVAKIA

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Abstract: Agricultural education and training in the former Czechoslovakia has traditionally focused on fostering the position of cooperatives and state farms. The destruction of socialist agriculture and the reduction of commuting opportunities in the urban space during the transition have resulted in the handicapped socio-economic position of the Slovak countryside and its population. The role of education and training in fostering agribusiness growth and rural development could therefore become a crucial strategy. The aim of this article is to analyse the current state of education and training for agribusiness and for rural development in Slovakia using the methods of literature research and document analysis. The article interprets general trends in the development of adult education in Slovakia during the transition period. The main priorities and perspectives formulated in the national strategy for education in agriculture (for the period 2007-2013) are discussed in the mentioned context. With a focus on the leading role of the Slovak University of Agriculture in Nitra, the paper assesses the current status of formal and further agricultural education and training offered in academic and other educational institutions. The paper concludes by discussing implications, recommendations and challenges for developing education and training initiatives for agribusiness and rural development.

Key words: adult education, agricultural education, post-socialist transformation

1. Introduction

The Slovak educational system has undergone radical changes during the past few decades. The transformation of the political system and introduction of the market economy in the 1990s influenced the development of adult education and training considerably. Qualitative changes have taken place in administration, management, curriculum and policy making. This has influenced the relationship between the adult education network and its societal context (Švec 1998). Presently, 36% of the Slovak adult population have completed secondary education (passing a leaving exam) and 9.9% have a university education. (European Commission 2011, p. 20) The content of further education in secondary schools and universities is relatively similar to the formal education what do you mean by formal? Do you mean pre-secondary? i.e. primary? Confusing...) but shorter courses are offered. In-company education usually reflects the needs of the employers and both private educational institutions and civic associations offer varied courses according to the interests of their "paying" participants. The negative figures for Slovakia are being presented in the sphere of lifelong learning – adult participation in Slovakia was at 2.8% in 2010, while the EU average was 9.3% (National Lifelong Learning Institute 2012, p. 48). The most common barriers appear to be the cost of the education, time at which they are held, and the fact that further education learning outcomes do not guarantee a higher salary or better employability.

Agricultural education is an old area of study in Slovakia. After 1945, agricultural education developed a new face, because new ideology was implemented and the corresponding policies were introduced into specialised education. A new organisational structure was set up in 1952 and in 1972 another content-based transformation of the agricultural education took place. A special emphasis was put on the practical skills of students and graduates for the work in state farms and cooperatives. (Bielik *et al* 2012) After 1989, new and modern study forms were offered in the field of the agricultural education, too (e.g. specialised study, retraining study, distance study, further education courses for various population groups). As the only institution of higher education in Slovakia oriented to agriculture and rural development, the Slovak University of Agriculture in Nitra (SUA) plays a crucial role within this process.

2. Development of the adult education system in post-socialist Slovakia

2.1 General outline and changing orientation

The Slovak Republic has quite a long tradition of adult education, especially vocational education and training (VET). During the period of centrally planned economy, all interested adults could undertake educational activities at state institutions or within various "cultural centres". These activities were usually provided in exchange for a symbolic payment. The socialist period was also characterised by a well-established system of enterprise-affiliated VET. The majority of state enterprises had their own training centres for employees. (Kočanová 2007) After 1989, educational centres closed down and traditional adult education providers started to operate as any other private body. The number of private and non-governmental VET providers has increased significantly. It is estimated that at present there are around 2500 providers of continuing education and training in the Slovak Republic. The terms ‚continuing education' (CE) and ‚lifelong education' (LLE) came into use only after 1990. Many small and medium companies emerged, providing non-degree and CE courses. Universities started establishing Centres for CE, LLE or other forms of further education, and professional organisations started providing non-degree or post diploma studies. Though sometimes through loopholes in the legislation, distance education and CE courses gave HEIs a possibility to make "real money" and to become market-oriented. Recent tendencies and issues related to the development of adult learning can be identified through different strategic documents. In 2007, the *Lifelong Learning and Lifelong Guidance Strategy* was approved with a perspective to its fulfilment in 2015. One of the outcomes of this strategy is the *Act No. 568/2009 on Lifelong Learning* adopted in December 2009, which established several important institutes for the further development of lifelong learning, such as accreditation of qualification standards, recognition of learning outcomes, and monitoring and predicting educational needs. These tools have not yet been put into practice, mainly due to the non-implementation of a system project to promote further education, within which these tools should have been developed (National Lifelong Learning Institute 2012, p. 48). Likewise, concentrated and coordinated action of all stakeholders has not yet been achieved in adequate measure.

2.2 Agricultural education

Agricultural education in contemporary Slovakia attempts to meet the requirements of a new shape of this economic sector with respect to the inadequate educational level of rural and agricultural population[1]. This situation has been caused by the transformation process after 1989, which affected not only agriculture, but also strongly influenced further development in rural areas (Moravčíková and Klimentová 2011). Farmland has been redistributed as private property and rural incomes have dropped in comparison to the national average. Many of the new owners had no intention to farm and rented out their land. Even the members of cooperatives without ownership of the land became owners, their property shares being derived from their work participation. In general, employment in agriculture has drastically declined[2] and rural workers have left for jobs elsewhere, especially to the service sector (Buchta 2011; Hraba *et al* 1999; Námerová 1997).

The agricultural sector in Slovakia has been primarily been employing people with basic or vocational education in recent years.

Table 1. Educational structure of employees in the Slovak agriculture.

	Year / Share of total (%)		
Educational level	2001	2005	2012
Basic	16.0	14.8	8.6
Vocational	56.7	50.5	53.6
Secondary	22.9	27.7	30.7
University	4.4	7.0	7.1

Source: Statistical Office of the SR (Labour Force Sample Survey)

Although there are around 100 secondary vocational schools oriented towards agriculture, the food industry, rural development, forestry and veterinary sciences in Slovakia, the number of students and graduates has rapidly decreased (Ministry of Agriculture of the SR 2007, p. 39). The critical situation in the agriculture sector and the alarming situation within agricultural education is characterised also by the highest unemployment rate in the group of secondary graduates.

Table 2. Unemployment rate of secondary vocational school graduates.

	Unemployment rate (%)					
Study specialisation	2006	2007	2008	2009	2010	2011
Agriculture, forestry and rural development	16.2	16.1	16.0	28.1	26.3	26.5
Veterinary sciences	10.5	8.9	7.9	16.5	17.5	16.5
Total (specialisation group)	15.9	15.6	15.4	27.1	25.2	24.8

Source: Institute of Information and Prognoses of Education

[1] According to *Labour Force Sample Survey 2011,* within agriculture a total of 51,600 workers was employed. On an annual basis, the number of people working in agriculture has decreased by 4,700 persons (8.3%) in the period 2011–2012. The decrease in employment was recorded only for the group of employees, while the group of entrepreneurs has been increasing in the long run. According to the *Statistical Report on Basic Development Tendencies in the Economy of the SR* in 2011 there were 80 thousand people working in agriculture, which means an annual increase of 2.3% (Ministry of Agriculture and Rural Development of the SR 2012, p. 36).

[2] The number of these persons reached 351.2 thousand in 1989 and dropped to 65.3 thousand in 2009. In the period 2000–2008, employment within the agricultural sector declined by one third but the number of persons working on the basis of an agreement for the performance of work increased to 2.5 times the previous figure. A significantly progressive increase in the share of persons working out of the official labour relation was characteristic for all forms of legal entities within agriculture.

This group of specialisation took an 18% share of the total number of unemployed graduates from secondary vocational schools in 2010 (National Lifelong Learning Institute 2012, p. 48). There is also a growing tendency in agriculture to employ many people aged 50–54 (over 20%). In comparison with the situation in 1989, this is a more than double increase in this category within the age structure of the agricultural population. At the same time, the share of employees aged 20–24 has decreased by half (Ministry of Agriculture of the SR 2007, p. 39).

In view of the above-mentioned facts, the necessity for people with secondary and higher education in rural areas and agriculture seems to be a very strategic issue for the intersection of different policies (educational, agricultural and rural development policy, youth policy). It is important to create appropriate conditions for the employment of young graduates in this sector and to motivate them to become entrepreneurs or to work in agriculture.

3. The current state of education for agribusiness and rural development

3.1 Formal and further education at the SUA in Nitra

The Slovak University of Agriculture (SUA) in Nitra is the leading educational and scientific institution for the agricultural sector. Its main aim is to support the development of rural areas in Slovakia through the provision of education, research and advisory services to agriculture and its related industries. In 2010, the SUA was the first university in Slovakia to be awarded a prestigious ECTS Label for the correct implementation of ECTS. The SUA comprises six faculties – the Faculty of Agrobiology and Food Sources (FAFS), the Faculty of Economics and Management (FEM), the Faculty of Engineering (FE), the Faculty of Horticulture and Landscape Engineering (FHLE), the Faculty of Biotechnology and Food Sciences (FBFS) and the Faculty of European Studies and Regional Development (FESRD). These faculties offer 88 study programmes at all levels of study, which correspond to the mission and role of the university in the Slovak society, as well as to the needs of contemporary agribusiness and rural development in Slovakia. In recent years, the number of student has stabilised at a level of about 10,000 students (including both full-time and part-time).

The SUA in Nitra actively participates in European research, education partnerships and in organising international events. It is connected internationally with 45 partner institutions in 21 countries at the present time. The Department of Economics (former Department of Agricultural Economics) has contributed markedly to the development of international cooperation with universities in West Europe and the USA, particularly in terms of following and implementing new trends in agribusiness education (Bielik and Dragan 2007; Gurčík 2011). New trends were recorded in creating the joint study programmes with foreign universities. The FEM offers the *V4 Business Economics* and the MBA programme *Agribusiness and Commerce* within the AGRIMBA network and there are also joint study programmes at the FESRD (*EU-US Double Degree in Rural Development and Agricultural Economics*, *International Master of Science in Rural Development*, *Canada-EU Programme for Cooperation in Higher Education, Training and Youth*) and at the FBFS (*Animal Welfare*) taught at the doctoral level of study.

Educational activities for students, graduates and public (certified further education programmes, career centre, education for seniors etc.) are coordinated by the Office for Lifelong Learning at the SUA, which cooperates with other universities within the Slovak Academic Association for Lifelong Learning (SAALL). This is an area in which SUA wishes to develop capacity and thus strengthen its contribution to agriculture and rural development at the local and regional levels. The SUA currently offers adult education at different levels including:

(i) courses of specialised training in economics, agribusiness, rural development and agriculture (certified by the Ministry of Education, Science, Research and Sport of the SR)[3]
(ii) language courses (international certificate *UniCert*®)
(iii) IT courses (international certificate *ECDL*)
(iv) education for senior citizens (*University of the Third Age*)[4]
(v) complementary pedagogical study for teachers at agricultural vocational schools (part-time study) and for full-time students. The graduates of this additional form of study receive the *Teacher Certificate* which enables them to teach agricultural subjects and subjects related to their study programmes at vocational schools.

Table 3. Number of participants in further education at the SUA.

Academic year	Specialized courses (i), (ii), (iii)	University of the Third Age (iv)	Complementary pedagogical study (v)	Total
2006/2007	398	498	301	1,197
2007/2008	379	569	219	1,167
2008/2009	174	670	228	1,072
2009/2010	496	761	76	1,333
2010/2011	496	573	240	1,309
2011/2012	602	485	113	1,200
Total	2,545	3,556	1,177	7,278

Source: Reports on the Education at the SUA

[3]For example: Non-traditional plants in rural development and the agri-food sector; course for pig keepers; water risks in food production; malting and beer-making; sensory evaluation of food and drinks; managerial skills; economy and management in the European dimension; LEADER approach in strategic rural development; etc.

[4]For example: foodstuffs, nutrients and health; horticulture; garden architecture; ecological family farming; informatics; basic accountancy; English language; public management, etc.

The main goal of the SUA in the field of further education is to enlarge the number of certified training courses and educational programmes that are on offer, to realise new forms of further education (virtual education, distance learning, e-learning) and to strengthen cooperation with the Office for Labour, Social Affairs and Family (further education for unemployed people).

3.2 Further education in agriculture (other institutions and activities))

Competitiveness and sustainable development of agriculture, food industry, forestry and veterinary sciences in the rural space guarantee the development of the whole sector. Furthermore, they also guarantee rural development, utilisation of the human potential as well as stable conditions for entrepreneurship with respect for environmental principles. The investment in human capital seems to be one of the main priorities.

The Ministry of Agriculture and Rural Development of the SR offers further education through its own contributory organisations. *Agro-Institute Nitra* is the educational institution involved in the development of continuing education strategies and concepts in the agriculture sector, particularly related to food production. It has its own centre of continuing education mainly focused on the agricultural sector and is one of the most important adult learning institutions focusing its training policy particularly on agricultural and rural development. The *Rural Development Agency* promotes particularly the Rural Development Programme of the SR 2007–2013 and its main aim is to disseminate information, to communicate feedback to the Ministry and other responsible state and public bodies, and to provide counselling. The *National Forest Centre* plays the leading role in the development and promotion of sustainable forest management and its implementation in practice. The educational activities are realised through the *Institute for Forest Consulting and Education* in Zvolen, which offers advisory services, pedagogical trainings, education and training for forestry professionals, etc. The *Institute of Postgraduate Education of Veterinary Surgeons* in Košice specialises in educating the employees of the state veterinary and food administration of the SR and the state veterinary and food institutes in all spheres of the veterinary care, food and foodstuff hygiene as well as food control, food safety and quality.

The current state and the recent situation in the field of further education in agriculture and related areas can be characterised as a system "suffering" from a lack of internal resources, but also from a lack of external support. The low social status of agriculture and the agricultural population in contemporary Slovakia has resulted in an insufficient supply of education and training courses for the agriculture sector as well as in a low level of participation in these activities.

The changing situation is influenced mainly by the number of the ongoing educational projects within the Rural Development Programme of the SR 2007–2013 (*Axis 1: Improving the competitiveness of the agricultural and forestry sector; Measure 1.6 Vocational training and information actions; and Axis 3: Quality of life in rural areas and diversification of the rural economy; Measure 3.3.Training and information*). In this context, it is significant that external funding for further education in agriculture and related fields is one of the crucial factors.

Table 4. Educational programmes (EP) and participants in further education oriented to agriculture, forestry and veterinary sciences*

Year	Number of EP	Share of total (%)	Number of participants	Share of total (%)%
2006	276	8.36	15,911	4.60
2007	225	6.34	11,482	2.38
2008	258	7.32	20,471	5.28
2009	444	9.77	26,409	8.25
2010	202	2.96	11,639	3.11
2011	415	1.89	12,936	4.32

Source: Institute of Information and Prognoses of Education, Information System of Further Education

*share of all fields of further education and all participants in further education in Slovakia

4. Conclusion

The current situation in adult education in Slovakia, particularly in further education, is strongly influenced by societal transformation from 1989 onwards. A general look at the state of funding of further education shows that in comparison with the financing of formal education, further education is significantly neglected. Within the group of low-skilled and unskilled people (often working in the agriculture sector), the price of the education programme seems to be the largest obstacle to their accessing further education. The financial factor is key in the motivation of individuals to invest in qualification and personal development. For this reason, it is essential to create opportunities for further education funding that would encourage people to take part in lifelong learning.

Although agriculture and agricultural education represent a traditional area of work and study from a historical viewpoint, their general position in contemporary Slovak society has dramatically declined. The socio-demographic structure of the agricultural and rural population in Slovakia reflects neither the requirements of the modern development of rural areas, nor the needs of the targeted support of the agriculture, food and forestry sectors. Thus, it is necessary to create activities which will facilitate the further development of rural areas, training and skills of the rural population and will contribute to the retention of the population in rural areas. It is essential to increase the absorption capacity through the vocational training of rural entities by organising training programmes aimed at reducing the deficit in expert, professional and management skills in the agriculture sector and rural development.

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SPATIAL URBAN PLANS AS A BASIS FOR AGRIBUSINESS DEVELOPMENT

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Abstract: The main goals of the spatial development of rural areas are to protect and prevent degradation of agricultural land, forests and protected areas, as well as to encourage (more) balanced territorial development. Given that the quality and development of agriculture largely depend on the level of consciousness and awareness of the population in rural areas as to the opportunities and benefits of their involvement in the adoption and approval of planning solutions, the aim of this paper is to define a communication strategy to help raise the awareness of the focus groups (landowners, farmers and investors) of the importance of and link between spatial planning and development of agribusiness and rural areas, exploring different techniques and methods of using various communication channels. The methods which will be used in the paper include secondary research, SWOT analysis, and trend and historical analysis.
The research results show that it is essential from the very beginning to take the views of various stakeholders into account through frequent thematic dialogues, in order to incorporate a consensus which has been reached together with the expert team of the developer, into planning decisions. Only such an approach can lead to sustainable and enforceable plans as prerequisites for the realisation of realistically planned investment in rural areas. Furthermore, it is very important to legally standardise such an approach so that public participation, as a mandatory legal procedure, can be defined through precisely defined steps and established performance indicators from the very beginning of the process of adopting planning documents.

Key words: agribusiness, spatial planning, communication strategy

1.Introduction

A large number of countries, including Montenegro, lack a tradition of public debate, transparency and accountability, these having become essential to the western model of democratic decision-making. Spatial urban plans are developed mainly according to the bureaucratic-technocratic approach, which suggests including the public only during the stage of public debate when a planning document is finished.

In developing the spatial urban plans of the local government, reaching a consensus among stakeholders on key common issues and relevant policy choices at frequent and comprehensive public consultations is of great importance to the business sector in general and, due to the territorial limits of the rural areas and socio-cultural dispersion of the key stakeholders, to the agribusiness sector.

A well-designed communication strategy and a systematic methodology which is conducted by a well-integrated team made up of the representatives of the local government, the developer of the plan, the non-governmental sector and focus groups interested in the development of agribusiness, would significantly raise public awareness and understanding of the benefits of public participation in the plan development process and development of the agribusiness sector. In addition, plans created using the "bottom-up" principle, and involving public participation from the earliest stages of their development through to their adoption would be "common property" and their reality, sustainability and enforceability would be guaranteed, which has not been the case in Montenegro until now.

2. Methodology used for the development of the scientific paper

In order to deal with the topic in the best possible way, a number of different methods and techniques were used in writing the paper.

All the relevant documents regarding the area of spatial-urban planning, with special reference to Montenegro, were collected using the method of secondary research. The studies that dealt with the issue of the inclusion of target groups in decision making processes were also analysed. A special emphasis was placed on the application of participatory approach. Historical and trend analysis indicated the main developmental processes in spatial planning and its importance in agribusiness development.

The method of compilation of different pieces of relevant research conducted among the target groups was also used in the paper.

Lastly, SWOT analysis was used to analyse the strengths, weaknesses, opportunities and threats of using spatial planning as a basis for agribusiness development. This analysis included the involvement of target groups of the public in this process.

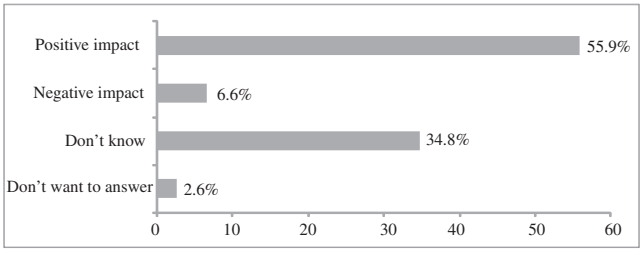
3. The importance of spatial-urban planning for agribusiness development

The two most important general issues and strategic goals that the developers of the Spatial-urban plan for rural areas are faced with, are 1) to protect and prevent the degradation of agricultural land, forests and protected areas, and 2) the restoration and development of devastated and empty villages and a wider rural area, encouraging farmers to return to the countryside and recommence their involvement in the production. This, of course, would involve a prior planning solution, and the subsequent implementation and resolving of infrastructural problems, planning prerequisites for the construction of housing facilities and commercial buildings related to agribusiness and tourism, as preconditions for the return and residence of an agriculturally-oriented population and for the attraction of potential investors into the area. The permanent reduction of the number of active agricultural population and therefore the reduction of the labour force is obvious, due to the migration of young and competent people and their employment in other industries. Villages and agriculture have remained in the hands of the elders, and the demographic picture is quite unfavourable. Of the total number of persons who have changed their place of residence, nearly all (98.4 per cent) or 4,322 people have moved to urban settlements, while only 1.6 per cent or 72 people moved to other settlements (Monstat 2013, p. 6).

Given the importance of rural areas, agricultural production and agribusiness in the Spatial-urban plan, it is evident that the creation and adoption of high-quality, sustainable and enforceable planning solutions require landowners, farmers and potential investors in agribusiness to participate significantly in the planning process.

Unfortunately, the past experience of public participation in the development of spatial and urban plans and other strategic documents as well as other public policies of importance to the local government, is not encouraging. Public debates, which the Montenegrin legislation treats as a way of public consultation, are generally introduced very late in the planning process when the planning decisions have already been formed, and are seen as a legal formality, and not as an integral part of the planning process.

The research (Social Survey 2012, Project LAMP - MSDT / WB), which treated the topic of public participation in consultations on the adoption of spatial-urban plans and other strategic documents, was conducted on a sample of 806 households, or about 2,763 individuals - household members in 21 municipalities in Montenegro. 91% of natural persons said they had never attended a public debate concerning spatial and urban planning. Also, only 55.9% of all respondents believe that public debates have a positive effect on the quality of planning solutions.



Graph 1: The effect of public discussions in the creation of a good quality urban plan (natural person).
Source: Social Survey 2012, Project LAMP - MSDT / WB

Considering the division into Urban / Rural, 58.4% of the respondents from urban areas consider public discussions relevant to the adoption of quality spatial-urban plans, and 50.4% of the respondents from rural areas believe the same.

It is obvious that good communication channels between local government and representatives of the business community have not yet been established, as indicated by the great interest and small participation of this focus group in public consultations.

It can be seen from the research results that it is necessary to raise public awareness of the importance of participation by citizens and other focus groups, users of the space, in the process of developing the spatial planning documents.

The involvement of different target groups in the process of the creation of spatial urban plans has both positive and negative sides. It is presented by using the methodology of SWOT analysis:

STRENGHTS	WEAKNESSES
– Montenegro has great agricultural potential and it is a strategic priority – Montenegro has great agricultural potential and it is a strategic priority to develop this area by improving the agribusiness. One of the prerequisites is to develop spatial plans. – The existing documentation which regulates spatial planning is a good basis for its improvement. – In Montenegro, there are different stakeholders that can be involved in the whole process of spatial planning nad so make it better.	– Awareness of the importance of spatial planning has not been developed in Montenegro so far, nor has the possibility of involvement of different target groups in the process. – There is a lack of professional staff in Montenegro at all levels, especially the local that would lead the spatial planning process, which would include a participatory approach. – More and more people, especially young people, leave rural areas, and thus are not interested in joining in agribusiness.

OPPORTUNITIES	THREATS
– The process of accession to the european Union involves regulation issues in the field of spatial planning. These processes recommend a multidisciplinary approach, which include more target groups involved in the issue. – Application of participatory approaches in the planning process will enable better spatial planning and development of agribusiness, through the involvement of various stakeholders.	– The financial crisis caused poor financial situation, which can slow down the process of spatial planning and development of agribusiness. – If responsible and interested parties are not commited to this process, then this may cause a reduction in its quality. – Involvement of different stakeholders can lead to conflicts of their interest and their goals, which can slown down this process. – Legal – property issues are not resolved everywhere, which may hinder the planning process.

4. Proposals for public involvement in the development of spatial plans

In order to introduce the integral and participatory planning of agribusiness development, in parallel with the decision to produce the Spatial and urban plan, the first step for the local government is to initiate the establishment of the Citizens' Forum, which includes representatives of different types of space users and different social groups: the Citizens' Forum is a body that should provide and ensure public participation through different models and methods. One of the main tasks of the Forum is to participate in the development and verification of the Plan and Strategy for public participation, and to establish and coordinate specific working groups, such as for infrastructure, the economy, social activities and environmental protection issues.

The model of public participation is based mostly on direct contact, i.e. the network of "formal and informal" thematic meetings of the members of the Forum and Working groups with citizens and focus groups, with the participation of a large number of people. The meetings discuss all open issues and potential development opportunities and options, goals and priorities. This is followed by an analysis by the developer of the Plan, which takes into account possible opposed interests of different focus groups and potential conflicts between economic goals and environmental protection. Also, performance indicators are predefined and monitored and indicators for different areas of the municipality are compared through the benchmarking system, in order to improve less successful areas based on the experience of more successful ones. Within the Working group for the economy, a special group for agribusiness should be formed. It will include owners of agricultural land, farmers and entrepreneurs in agribusiness, potential investors in the agribusiness sector, non-governmental organisations that are in any way involved in the planning process related to the rural area, and representatives of the local government. The main tasks of this working group are to cooperate with municipalities in organising the participation of the public in various and innovative ways (workshops, Open House, visual research and so on), collect and present the views of local people involved in the agribusiness-group and, in collaboration with other working groups, describe required potential development opportunities, taking into consideration environmental factors and potential trade-offs between economic and environmental objectives.

The Agribusiness Group, in addition to the above general duties, participates actively in all phases of PUP development through specific tasks. In addition, in all phases of the plan development, the Group monitors and evaluates the transparency of the process and ensures that as great a number of people as possible is informed about all the activities related to the development of the Plan.

In order to effectively implement this process in practice, it is necessary to develop a Communication Strategy so that all stakeholders in the field of agribusiness can be informed adequately and on time about the process of PUP development and all focus groups encouraged to participate in this process from the earliest stages of the development of the Plan.

5. The strategy of communication with target groups of the public

The purpose of the Strategy is to cover the following strategic objectives:

Strategic Objective 1: Sources of information. Improving the quality and quantity of information disseminated by the Local government and Plan developer during the process of the Spatial-urban plan development;

Strategic Objective 2: Dissemination of information. Improving the mechanisms for information dissemination and communication channels that are used to inform the focus groups related to agribusiness about the opportunities to participate in the drafting process, and selection of the best solution.

Strategic Objective 3: Cooperation with other providers of information. Strengthening cooperation with institutions and organisations that are in any way involved in the planning process and can have an impact on the decision-making process related to agribusiness within the PUP

Target groups and levels of informing

The Campaign will be focused on the following target groups: (a) landowners, (b) farmers and entrepreneurs in agribusiness, (c) potential investors in the sector, (d) non-governmental organisations that are in any way involved in the planning process related to the rural area, and (e) media.

(a) Landowners

The role of this target group, representing the most numerous users of space, is to point out the problems in the functioning of the area of agribusiness, provide proposals and

suggestions on how to activate the agricultural land and other resources they own, make proposals and suggestions on the modes of cooperation and association with potential investors, and to define the conditions that have to be met in order for them to return to the countryside and to agriculture.

(b) Farmers and entrepreneurs in agribusiness

The role of this target group, representing the most important users of space, is to point out the problems in the functioning of the area of agribusiness, give their proposals for the solutions to these problems, and give suggestions for further development. In this sense, the messages that are created for this public should be written in simple and easily understandable language; they may require re-adjusting in order to reach specific sub-groups. The CS should explain, in a simple and clear way, the need to get the landowners engaged in the planning process, especially in target areas.

(c) Potential investors

The role of this target group is to provide proposals for business ideas and projects for the planning process, because private investment is one of the driving forces for the economy and agribusiness development of certain regions. The interest of this target group in the planning process is that their business ideas and needs should be incorporated in spatial urban plans in compliance with the development prospects for the region for which the plan is being developed. Also, the special interest of the private sector is appropriate land use zoning, according to their specific business needs. Bearing in mind that it is recognised that issuing permits is one of the biggest business barriers in Montenegro, the interest of this target group is the simplification of procedures and reduction of the processing time and documentation needed for obtaining the permits.

The **CS** will seek to raise awareness amongst this group about the reforms in spatial planning, the land use planning process, and in coordination with the **CS**, through special media broadcasts, web-pages for service users, round tables, workshops and publications.

d) Non-governmental organisations

This target group has a mediatory, consultative, educational, and monitoring role in the land use and planning process. The true creative role of NGOs lie in creating networks of information, innovation and interaction which enables people to communicate, share and receive information, resulting in a positive change in the long run. The interest of NGOs in the planning process is to facilitate interaction with agribusiness communities and among different social groups within communities in order to achieve sustainable spatial urban development. Also, NGOs are committed to increasing transparency in the planning process and land use. Through media, workshops, round tables and publications, the **CS** should contribute to the achievement of a high level of awareness and knowledge improvement, by informing all types of NGOs about the importance of their 'interactive' roles.

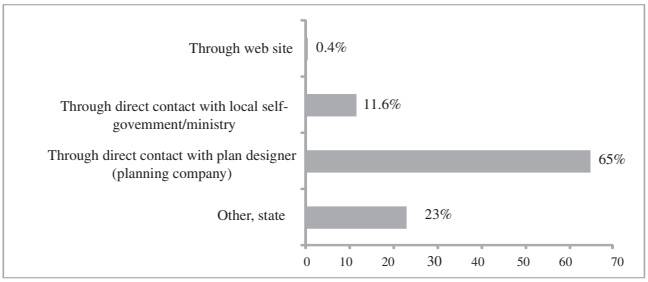
e) Media

This group represents a target group as well as a means to achieve the major objectives of the MS. The first phase of the MS should increase the media's knowledge about the process and benefits of spatial planning and importance of public participation in that process, especially in the area of agribusiness. After that, in the second phase, the role of the media should be to disseminate the correct information to the public, and thus mobilise other target groups for a more effective achievement of the plan objectives. Accordingly, through workshops, round tables, trainings, and informal meetings, the media (TV, radio and newspaper journalists) will be informed about the possibilities of including media in promotional activities and the role of the media to continually monitor the development of the process of public participation, especially in the area of agribusiness.

6. Communication channels with target groups of the public

The communicators must select channels of communication. There are two broad types of communication channels – personal and non-personal (Kotler and Armstrong, 2010: p. 436). The development and implementation of the methods of communication in the triangle (the public, the plan developer – and the local government) is of particular importance for the success of public participation in the development of the spatial urban plan.

In order to have a clearer picture of the planning solutions and the spatial planning documentation, the mentioned focus groups should have access to them. The survey results have shown (Social Survey 2012, Project LAMP - MSDT / WB) the best way to achieve that access, as the respondents primarily stressed the direct contact with the local self-government/ ministry as a means of achieving insight into planning documentation and solutions.



Graph 2: The best way of achieving insight into spatial-planning documentation and planning solutions (natural person).
Source: Social Survey 2012, Project LAMP – MSDT / WB

72.2% of the respondents from rural areas also believed that direct contact with the local self-government/ministry was the best way of getting insight into planning documentation and solutions.

As for making proposals, suggestions and criticism on the completed phase of planning documents and achieving insight into the analysis and Plan developer's answers to the given proposals, the best method is direct contact with the local population and other focus groups at thematic workshops in local centres. This contact is achieved through a series of formal and informal meetings with the Plan developer and local government officials. This also involves great initiative and leadership of the local government through the Secretariat of local government responsible for planning, other secretariats and local communities.

While talking about participatory presence, with the participation of all types of public groups, the experience has shown that the burden of the drafting process falls to the Secretariat of the local government responsible for planning activities. It is necessary to ensure the maximum participation of all other secretariats, for example those for economy and finance, social services, utilities, etc.

Local communities andw their employees are of great importance for the effective functioning of the participatory approach, especially in rural areas. This is reflected primarily in the timely informing of the residents of the local community (the local community centre and gravitating rural settlements) about the time, place, topic and importance of holding a meeting regarding the participation of local people. In addition, it is their obligation, in coordination with the local government and the Plan developer, to organise formal meetings, and also to collect common strategic orientations and goals that can be heard in informal meetings related to the development of the Plan and the subject of agribusiness in general.

7. Conclusion

Previous research has shown that Montenegrin practice is neither sufficiently focused on the participatory approach, nor on the inclusion of landowners, farmers, entrepreneurs and potential investors in the process of spatial urban planning. Bearing in mind the significant contribution of this approach to the quality of spatial-urban planning documents, particularly those relating to rural areas, it is essential to take into account the views of various stakeholders from the very beginning through frequent thematic dialogues, in order to incorporate a jointly-reached consensus into final planning decisions. Only such an approach can lead to sustainable and enforceable plans, these being prerequisites for the successful realisation of realistically planned investment in rural areas.

Implementation of the participatory approach in practice requires a change of the attitude to the planning process, involving the identification of key stakeholders as focus groups which should be included and whose views should be taken into account.

On the other hand, given that there is a lot of mistrust among the population that their voice will not be heard and that their suggestions will not be taken into account, it is necessary to change the awareness among citizens in both rural and urban areas, through integrated communication strategies. Efforts should also be made to change the awareness of those employed in the local administration who believe that the public is not interested in key developmental issues and is reluctant to take part in socially responsible activities of adopting important strategic documents for the local community.

Besides the above mentioned points, it is very important to ensure that such an approach is legally standardised so that public participation, as a mandatory legal procedure, is defined from the very beginning of the process, progressing through precisely defined steps and established performance indicators.

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