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- regional specificities -

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Economics of agriculture

SI – 2

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ECONOMIC JUSTIFICATION FOR VEGETABLE SEED CONCEPT OF SUSTAINABLE ORGANIC PRODUCTION

Adžić Slađan¹, Suzana Pavlović, Jasmina Zdravković

Abstract

According to the Office for Statistics of the Republic of Serbia, vegetable production takes place on around 284 000 ha. Only 490 hectares of this area is under organic production. This area is absolutely insufficient in comparison with EU countries and neighboring countries. One of the reasons for this low percentage of organic food in our country can be a lack of appropriate, certified, organic seed. The task of seed companies is finding out a solution that will allow sufficient market supply with organic seed and planting material, as soon as possible. This paper analyzes the economics of beans, green beans, radish, small radish, lettuce and beetroot seed production, produced according to principles of organic vegetable production. Based on indicators of analytical calculations, it was established that the biggest profit is made in the production of beetroot seed, and the lowest in bean and green bean seed cultivars. All analyzed seed production was economically.

Key words: *organic production, organic seeds, vegetables, economy*

Introduction

Following the latest development trends in crop farming, we can say that the organic concept of growing plants is rising throughout the world and in our country. Recently we have witnessed increasing pressure of farmers on seed companies through demand for organically produced and certified seed. Since markets and restaurants, which offer the product of plants grown through the concept of organic farming have appeared, the pressure became higher. The vegetable seeds from the concept of organic production methods is very scarce in the domestic market. For these reasons,

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the vegetable seed companies, try to re-orient its conventional production towards the concept of organic seed production. Respecting the specificity carried from concept of vegetable organic seed production and standards that must be realized, the seed companies are faced with many difficulties. In addition, the diversity of varieties they could offer to farmers is very poor. Considering the limiting factors such as: soil, weather conditions, weeds and diseases, seed companies resort to the production of varieties that have some degree of resistance to them (Bonino and Cantliffe, 2009). Due the same reasons the seed companies avoid the production of hybrid seeds and some new highly productive cultivars that require intensive use of conventional funds for its cultivation. That is why we could often hear complaints of farmers how they can't find favorite varieties or hybrids in offer of organic certified seed. Seed companies and particularly those that produce vegetable seeds which in product range have a very large number of divergent plant species, are in great doubt regarding the extent and economic justify of the concept of production of organic certified seed. The aim of this paper is to show exactly the production of certified organic seed: bean, green bean, radish, small radish, lettuce and beetroot at the Institute of Vegetable Crops, Smederevska Palanka and its economic justification.

Justification for future agricultural production should be found in higher and higher prices and income that can be achieved by the concept of organic production, which is indicated by cost benefit ratio (Adhikari, 2009).

Methodology

As data in this study, we used the accounting records of the Institute for Vegetable Crops, Smederevska Palanka (Costing), as well as records of costs and yields achieved in the production of beans, green beans, radish, small radish, lettuce and beetroot in the experimental field of institute in 2010. In order to determinate the sale prices of vegetable seed, the price list of the Institute for Vegetable Crops has been used. The economic analysis was performed using the method of calculation for determining cost and calculating the basic indicators of profitability of seed production of analyzed vegetable crops.

Results and discussion

For each plant production and particularly for the concept of organic vegetable seed production, it is necessary to know the technology of growing, which, in this case, is not easy at all, and to know the economic parameters that determine justification of certain organic seed production. Improving and position of production is largely defined by economic effect that it achieves (Brodt et al., 2006). Achieved economic effect is a limiting factor in making decisions to start the seed production in the seed company or by the farmers.

Our paper analyzed the seed production of divergent types of vegetables, which in concept production organic requires high investments. However, the invested funds are returned through the achieved yield and its market price. In table 2, we can see seed yields for beans, green beans, radish, small radish, lettuce and beetroot. Yield per hectare (1 ha) was ranged from 140 kg for the radish and small radish to 650 kg for beans and green beans. If we make an analysis of production for the mentioned plant species, we will notice that some species have identical cost structure (beans / green beans and radish / small radish) that occur during seed production. Also, in the botanical sense

this plant species belong to the same families. The calculated cost per unit for the beans / green beans is 21 €/kg, radish / small radishes 90 €/kg, lettuce 86 €/kg and beetroot 75 €/kg. These prices cover production costs in our study which achieved yields. The costs of elements of production directly affect the profits and profitability (Muncan and Zivkovic, 2004). Successful management of production means that managers need to know, at any time, the amount, structure and dynamics of costs (Kay et al., 2008). Analysis of individual costs incurred during our seed production (Table 1), shows that in most production, the largest costs, besides the cost of procurement of seed are the labor costs. This cost can not be to decreased the concept of organic farming means a reduced use of pesticides which results in increase of human labor. Labor costs, depending on the type of production, participate for 13.59% in the total cost of produce of seed beans and green beans, and 16.02% of the lettuce (Table 1). In the concept of organic seed production, increased production costs is compensate by higher prices of organically produced seed and up to 5 times compared to conventional production (Labrada, 2004; Zeijden, 2004).

Table 1. Cost of certified organic seed production of beans, green beans, radish, small radish, lettuce and beetroot per unit area (€/ha).

costs:	beetroot	radish small radish	beans, green beans	lettuce
destruction of previous crop residues	10	10	10	10
manure	280	280	0	280
removal of manure	30	30	0	30
mineral fertilizers and other fertilizers	500	500	30	500
fertilization	20	20	0	20
basic processing - plowing	100	100	100	100
seed	700	400	2160	40
additional processing	50	50	50	50
preparation for sowing	40	40	40	40
sowing	40	40	40	40
foliar fertilizer	30	30	30	30
spraying	20	20	20	20
inter-row cultivation	60	60	90	60
irrigation	300	200	200	200
seasonal labor	650	550	700	500
chemical control of pests and diseases	40	40	100	0
allowed chemical preparations	60	150	150	0
harvest - phase I	150	150	150	150
harvest - phase II	150	120	180	150
application of seed crops	250	250	250	250
control of seeds	150	150	150	150
seed finishing	350	150	400	200
certification	300	300	300	300
total costs:	4280	3640	5150	3120

Table 2. Yields per hectare (kg/ha), the unit price (€/kg), the value of production (€/ha).

	beatroot	radish, small radish	bean, green bean	lettuce
Yield (kg/ha)	285	140	650	180
price (€/kg)	75	90	21	86
production value (€/ha)	21375	12600	13650	15480

Production efficiency comes from the rational use of all productive resources and in our seed production was ranged from 2.65 for beans to 4.99 for beatroot. Calculated values indicate that all productions were economically justified. Profitability is output of total investment in seed production of beans and green beans, radish and small radish, lettuce and beetroot. The profitability coefficient is the lowest in seed-production of beans and green beans (62.27%), and the highest in the seed-production of beetroot (79.98%) (Table 3).

Table 3. Indicators of economic production of beans, green beans, radish, small radish, lettuce and beetroot on the principles of organic vegetable production.

	beatroot	radish, small radish	beans, green beans	lettuce
costs (€/ha)	4280	3640	5150	3120
income (€/ha)	21375	12600	13650	15480
price of expense (€/kg)	15,02	26	7,92	17,33
profit (€/ha)	17095	8960	8500	12360
threshold of profitability (kg, pieces / ha)	57,07	40,44	245,24	36,28
rate of profitability (profit of 100 €)	79,98	71,11	62,27	79,84
coefficient of efficiency	4,99	3,46	2,65	4,96

An economic analysis of the results indicates the influence of production volume and sales prices on the total value of production. It establishes different relationships as indicators measuring the quality of committed investment (efficiency).

Due to relatively high prices of seed produced by the principles of organic vegetable production, despite the modest yields the a significant value of production has been achieved.

In the production of beetroot seeds the highest production value (€ 21,375), with the yield of 285 kg/ha and with the sale price of 75 €/kg (Table 2) has been achieved. In the production of seed radish and small radish the lowest production value (€ 12,600), with a yield of 140 kg/ha and the price of 90 €/kg seed has been achieved.

Conclusion

Vegetable seed production based on the concept of organic production is very specific. It must be carefully planned and economically analysed to the detail. The expansion of organic agriculture is directly linked to the production of adequate seed. Calculated relative production indicators show that all the above production were economically justified. Most economical seed production is the production of beetroot seed. Economy coefficient was 4.99, the rate of profitability 79.98% and the absolute indicator-profit has a value of 17,095 €/ha. The least cost-effective production of seed cultivars with economy coefficient of 2.65, rate of profitability 62.27% , and profit of 8,500 €/ha, were seed-produce of bean and green bean. Expressed economic indicators were result of research in seed-production of beans, green beans, radish, radishes, lettuce, and beetroot in the concept of organic production tehnology in market conditions in Republic of Serbia.

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POSSIBILITY FOR DEVELOPMENT OF ORGANIC LIVESTOCK BREEDING IN AREA OF GOLIJIA MOUNTAIN¹

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Abstract

Given to the structure and characteristics of the terrain, which is reflected in the large areas of grassland and grassy meadows, the area within the park of nature „Golija“, there are excellent conditions for development of agriculture and livestock breeding, and therefore the production of milk and milk products. Organic livestock enables sustainable development of human communities in the regions covered with the modes of protection of natural resources, while providing the proper exploitation of existing agricultural areas and preventing further degradation of natural meadows and pastures. The subventions granted by the state for organic production, caused the appearance of the first manufacturers who choose to switch to this type of agricultural production.

The aim of this paper is to indicate the possibility and prospects of its development in Golija based on the current situation in livestock breeding, as well as the possibilities and prospects of development of organic production due to the preservation of nature and environmental aspects that exist.

Key words: *livestock breeding, milk, organic production, possibility*

Introduction

In all branches of livestock breeding there is a significant potential for the development of organic livestock production, especially in the hilly and mountainous terrains, such as the site of Golija mountain. Thanks to the depopulation trend,

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agricultural activities have been partially neglected in this area, so that an intensive development of production has not been accomplished. The prevailing racial structure and traditional cattle keeping in the hilly-mountainous regions in cattle breeding and sheep raising, as well as the preserved traditional production of autochthonous sorts of dairies (cheese and a special kind of cream called „kajmak“) in the households, serve in favour of the development of organic livestock production.

Also, the presence of large areas of meadows and pastures which are not used in these regions due to the multi-decade decreasing of the head of cattle, represents a great potential. These regions have often, precisely because of underdevelopment, evaded chemization and pollution which accompany the development, so that these natural communities are preserved. Highly expressed resistance of autochthonous species enables their breeding without significant investments into the medical care and treatment, so, in that way, animal products of special quality for human nourishment are produced, which do not contain residues of different antibiotics and plant health products.

In recent years there has been a significant increase in the interest for the organic agriculture, as a reaction to the highly-expressed ecological degradation, deterioration of food quality, as well as the growing endangering of the health of human race. Consumers buy this kind of food mainly because of health reasons or because this food has better taste. Constant growth of the demand for the organic products throughout the world points to the fact that this production method can be highly profitable if natural resources, knowledge and production experience are used in the right way.

Cattle breeding conditions on Golija mountain

Based on the „Spatial plan“ (Official Gazette of the Republic of Serbia, no.16, from Mrch, 6, 2009.) Golija mountain has been labelled as Natural Park – a region of special purpose, with the total area of 93866 ha (938,66 km²). The mentioned area of Golija mountain is situated within the borders of three administrative districts (Moravicki, Raski and Zlatiborski), within which the important administrative centers are the following towns: Novi Pazar and Kraljevo, municipalities: Ivanjica, Sjenica and Raska.

According to the cattle fund during the period from 1991-2002. there has been a decrease on the level of municipalities of Golija: the number of cattle was from 25.6 % (the least) to 44.0% (the most), the number of sheep was 32.0% to 55.0 %. (Literatura 4.) This continuous decrease in the cattle fund, as well as the less number of active „bačišta“ is connected with the highly expressed trend of village and farming desertion, and with the fact that the ones who stay at the country and cultivate the land are mostly elderly people. There exist a small number of registered „Bacista“ on Ivanjica side. Besides, there are two registered farms: „The Golija river“ for sheep breeding and „Preko Brdo“ for summer grazing. On the side belonging to the Raska municipality, there is also a small number of private mini-farms. A well-equipped „ecological“ farm occupies an area of 220 ha in the settlement called Vrujici/ Duga Poljana, which belongs to the municipality of Sjenica. (Spatial Plan Golija, 2009). Private households deal with

cattle breeding for their private needs. The purchase of milk is rarely organized on a large scale and is still on the level of local shops or agricultural pharmacies. (data gained by a personal contact with a researcher from „ecological“farm).

According to the available statistical and literary data regarding the peculiarities of cattle breeding on Golija mountain, apart from the given common parameters, the state of these areas and perspectives for development in relation to the certain municipalities and towns which are, actually, as administrative centers, the skeleton for further development, should be considered.

The total number of agricultural areas on the territory of **Raska** municipality is 33,284 ha. Among that, 24,457 ha are meadows and pastures and 6,440 ha is cultivated land. The total number of rural households is 5,967, among which 4,462 households are dealing with agriculture. Cattle breeding is the most common agricultural branch which is distinguished by a very good breed structure, among which the dominant race is Simmental and Domestic Mottled Beef. The total head of cattle in 2007. was 5,698, among which the number of cows and breeding heifers was 4,527. It is interesting that the number of head cattle is smaller in regard to the area units, and it amounts to 37 per 100 ha of agricultural area.

According to the statistical data, the number of cattle decreased in 2007. for 10.8%, and the number of sheep for 1.4% in relation to 2006. The most common sheep breeds are: Sjenicka, Virtemberg and mixed breeds. The total number of sheep is 10,619, averagely 32 sheep per 100 ha of agricultural area. (Tabele 1.) In recent years, there has been the more and more households dealing with the breeding of Alps goats, which are characterized by high fertility and milkiness.

Table 1. The number of cattle of sheep in the researched municipalities and towns and calculated indexes for 2007 / 06.

Municipalities	Number of cattle Situation from 01.12.2007..		Index 2007/2006 %		Number of sheep Situation from 01.12.2007.		Index 2007/2006 %	
	Total	Cows, Breeding heifers	Total	Cows, Breeding heifers	Total	Breeding sheep	Total	Breeding sheep
Sjenica	20.218	14.061	102.9	108.2	18.946	13.212	106.2	105.0
Ivanjica	11.420	6.625	89.8	92.5	24.319	19.149	105.5	106.2
Kraljevo	25.078	18.183	88.2	96.5	22.265	17.904	98.5	103.5
Novi Pazar	10.377	7.528	89.2	96.4	8.114	5.016	98.6	103.5
Raška	5.698	4.527	89.2	94.4	10.619	8.395	98.6	105.3

The source: Serbian Bureau of Statistics- Municipalities in Serbia 2009.

From the total area of the municipality of **Kraljevo** (1529.5 km² or 150.950 ha), agricultural areas occupy 724.98 ha. Among that, plough-fields occupy 31.7% (23,000 ha), pastures 33.15 % (24,000 ha), meadows 24.8 % (18,000 ha). The allotment of pastures and meadows comes to 57.9% of the total area of agricultural land. This

datum points to the orientation of agricultural production towards the development of livestockbreeding and feedstuff production.

According to the statistical data, the number of the heads of cattle decreased in 2007. In relation to 2006. For 3, 346 heads, or for about 11.8%, while in sheep raising we have a decrease of 337 sheep or 1.5% (Table 1.). In the region of sheep raising, fattening bullocks, milk production and sheep breeding are dominant.

The existing level of agriculture does not satisfy the potential which is offered by the natural conveniences on the municipal territory. There are several reasons for that: first of all, small,pulverized agricultural holdings which do not offer the possibilities for the higher production volume are prevailing; machinery is quite old-fashioned,depopulation of villages and ageing of agricultural population, reduced implementation of agricultural practices, non-existence of industrial capacity for the processing of agricultural raw materials, there is also a problem of the breach of the requested standards of quality in the process of agricultural production as well as weak linkage and organization in the market approach of individual agricultural manufacturers.

On the region of Golija, the town of **Novi Pazar** has five cadastral districts. Considering the fact that this is mostly mountaneous area, of the total agricultural acreage there are mostly natural grasslands (70.85 %), among which 29.55% or 11,717 ha consists of meadows and 41.3% or 14,981 ha consists of pastures Total agricultural area of 84% is private property, while the share of public property of pastures amounts to 37%.

The area of the municipality of Novi Pazar is traditionally oriented towards agricultural production, especially cattlebreeding. At the beginning of 2007. the number of agricultural holdings was 2,148. Out of the total number of registered inhabitants (85.996 (2002.)), agricultural population consists of 10%, and, out of this number, individual farmers occupy 58%.

What worries the most is the fact that the head of cattle decreases, especially in sheep raising. The number of sheep which was 13,519 in 1999 decreased for 5,405 heads of sheep at the end of the observed period in 2007 and it amounted 8,114 heads, which is about 40% less. Among that, 57 % was sheep for breeding (this share was 86 % in 1999). The number of heads of cattle decreased in 2007. For 10.8% and the number of sheep for 1.4 % regarding the observed 2006. (Table 1.). The majority of heads is bred on pulverized goods and for the personal needs of manufacturer so that an institutional support (the improvement of genetic composition, security investments, the development of adequate and accredited processing capacity, the trainig of manufacturers) is necessary, whether it comes from the state, local authorities or international donor programs.

In the municipality of Novi Pazar, the existing capacities for milk production do not satisfy the needs of the locals. The specific is that there exists a dairy (Simlek-Dezeva) which is specialized for the production of different types of high-quality cheese (cheese with holes in it, hard caciocavalo); also, it has all the technical conditions and certificates for the export of its products. The capacity of this dairy is 5000 litres daily, although the daily purchase and production is significantly less and is about 700 litres. (literature 7)

Cattle production is a dominant branch of agriculture in **Ivanjica**, since Ivanjica a municipality that belongs to the area of Golija. The biggest share in total cultivated land (33,284 ha which represent 47,1% of total municipal land) have natural lawns–about 64,3%, of which 36,7% (18,899 ha) are meadows and 27,5% (14,111 ha) are

pastures. Recently, development of organic agriculture is noticeable, especially in the area of Natural park Golija. 15 KO of this municipality belongs to the area of Golija.

Although the area of Ivanjica has favorable conditions for the development of cattle breeding (large lawns), statistical data point at the fact that the number of cattle continues to decline, and in 2007. there was 10,2% reduced number of cattle in relation to 2006., but the number of sheep was 5,5% increased. Table 1. It could be concluded that during the several past years, breeding composition of cattle was changed. Individual farms mostly deal with combined type of production – milk/meat and domestic colourful type of cattle in simmental type was mostly raised.

According to the data of the Republic Bureau of Statistics of Serbia, on the territory of municipality **Sjenica** there was 21.285 heads of cattle in 2004. (cows and heifer 14.994), 17.513 sheep. Sheep raising is a leading branch of cattle breeding in Sjeičko-pešterska visoravan. The number of sheep was reduced for 42.488 in the last 2 decades of 20 century. Well known domestic sheep Sjenica „pramenka“, which gives 60l of milk per year, is being raised on Pešter.

According to the statistical data and calculation of base index for 2007. there was a 5 % reduction in relation to 2004, and in relation to 2006. there was 2,9% increase in the number of head of cattle. An increase in the number of sheep in 2007. in relation to 2004. was 5,3%, and in relation to 2006. it was 6,2% (tab. 1.). Calculation shows that the number of head of cattle and the number of sheep continues to increase, which points to an increase of the production of cattle products.

Constant improvement of the production of milk, not only the improvement of its quantity, but quality as well, must be one of the most important aims when we discuss about the development of cattle raising in this area. This is extremely important if we have in mind that the largest number of household use milk for the production of cheese, while only small quantities are delivered to dairies. Based on the data about cattle fund, the production of milk and dairy products continued to increase or reduce depending on the number of head of cattle and sheep.

Table 2. Calculation of sale and ransom of milk in 2008. in relation to 2007.

Municipalities	sale and purchase of milk in thousands of liters for 2006	sale and purchase of milk in thousands of liters for 2007	Index 2007/2006 (%)	sale and purchase of milk in thousands of liters for 2008	Index 2008/2007 (%)
Sjenica	4.913	6.847	139.3	6.631	96.8
Ivanjica	428	580	135.5	415	71.6
Kraljevo	22.050	14.257	64.65	15.151	106.3
Novi Pazar	4.154	4.851	116.8	4.686	96.6
Raška	1.071	1.250	116.7	1.425	114

Source : Personal calculation in relation to statistic data from „ Municipalities in Serbia 2007-2009“, The Republic Bureau of Statistics, Belgrade

On the slopes of Golija mountain is situated the town called Kraljevo, which is said to have the largest quantities of purchased milk in relation to the other researched towns and municipalities, which can be concluded from the indexes from Tabele 2.

According to the statistical data and calculation of base index in relation to the previous year 2006, in 2007. sale and ransom of milk on the territory of Kraljevo municipality was 35,4 % reduced, because the number of head of cattle was reduced too, for 11,8% and 1,5% for sheep.

Sale and ransome of milk was increased in 2007. in relation to 2006. in municipalities Sjenica (39,3%), Ivanjica (35,5%), Novi Pazar (16,8%) and Raška (16,7%), since there was an increase in the number of head of cattle and sheep on this area that belongs to Golija (tab. 1).

However, analyses of table 2. could points to the fact that the sale and purchase of milk in 2008 in municipalities Kraljevo 6,3% and Raska 14% inncreased, also there was evident an increased production of milk, while there was a decrease in municipalities Sjenica 3,2%, Ivanjica 28,4%, and Novi Pazar 3,4%, we could also recoqnize decrease of sale and ransome, compared to the 2007.

The basic aim of cattle production in hilly and mountainous area, where this region belongs is intensification of the production of milk and cheeses. Beside genetic material, which are being expressed through specific breed characteristics, the production of milk is influenced by environmental factors and the most important are food and lodging. Food is based on using food sold in bulk got from meadows and pastures.

According to the statistical data whih present area of meadows and pastures which is shown in table 3., as well as hay from meadows and pastures, Table 3., this region has significant possibilities for the production of quality fodder, which represents oneof the most important conditions for an intensive production of cow's and milk's milk, in othe rwords it represents a way to improve cattle raising in this area.

Table:3. The use of agricultural land of meadows and pastures and the yield of hay meadows and pastures, 2008

City, Municipality	meadows			pastures		
	meadows (ha)	yield		pastures (ha)	yield	
		Total, t	Per ha, kg		Total, t	Per ha, kg
Sjenica	26015	48830	1873	46587	32884	706
Ivanjica	19833	39626	1953	15319	2660	200
Kraljevo	19627	67453	2989	24014	22152	922
Novi Pazar	11744	23028	1857	14327	7897	551
Raška	8715	14891	1533	15742	9288	590

Source: Municipalities in Serbia 2009, RSZ, Belgrade

Area of mountain Golija has large number of lawns, which enable movement and natural way of nourishment for other animals on pasture. These conditions posiively influence for w3ell-being of dairy cow's, their productivity and good health,

which represents potential for the improvement of the production of milk and dairy products in these area. This production has long lasting tradition but because of present conditions it doesn't have organized character.

Perspective for the development of organic food

On the mountain Golija there are good conditions for the development of cattle production regarding preserved nature and pastures. Based on shown data about the region that belongs to Golija, it could be said that on that area there is a possibility for perspective of organic cattle raising, and at the same time the production of meat, milk and dairy, which are each day more and more looked for in our country and countries of EU.

The biggest part of natural meadows and pastures is placed in hilly and mountainous regions, where because of population trend agricultural activity partly died, so that intensive production was not realized. Ideal conditions for organic cattle raising are placed on localities which are less developed and where there is no economic base for big and fast development projects. Animals on this territory could be raised traditionally in a free system of keeping animals, and their food is based on the existent plant resources and doesn't ask for intensification of plant production. In that sense, raising of autochthonous breed, solid constitution contributes to preservice of biodiversity and enables respect of animal living association integrity in the regions that are under protection considering natural or/and cultural property.

According to the area plan of Natural park Golija, reconstruction is planned and the protection of those active bačičta on the territory of Area plan (as well as activation of deserted, on new program bases) which are significant for protection of cultural area where the production of milk will be performed. On the territory of Golija, starting with the production of healthy food is predicted, and first of all, the production of milk, dairy products and meat and creation of products with local protected marks.

Conclusion

Based on shown data about the region that belongs to Golija, it could be said that on that area there is a possibility for perspective of organic cattle raising, and at the same time the production of meat, milk and dairy, which are each day more and more looked for in our country and countries of EU.

Structure of agriculture production this region should be adapted to the needs of tourism demand with the following recommendations: production of food with high health value, development of the net of ransom dairy stations, program of standardization of cheese production technology on the whole territory, as well as a complete marketing for dairy products. It is necessary to improve placement of local agriculture products of high quality. That way secure market would be enabled, and producers will have guaranteed income.

Organic agriculture contribute to the optimal use of natural resources, to increasing the production (on the level of local communities), and especially total improvement of population status in rural area.

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ASPECTS OF SUSTAINABLE RURAL DEVELOPMENT IN THE MOUNTANIAN AREAS FROM N-E REGION OF ROMANIA

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Abstract

This paper intend to develop a methodology regarding actual size evaluation and the perspective of sustainable rural development through the elaboration of swot analysis, as method of strategic planning for the mountainian areas from the North-East Region of Romania.

Key words: *mountain areas, North East Region, rural development, SWOT analysis, strategic planning*

Introduction

Sustainable rural development one of the strategic objectives of the European Union is a complex process, comprehensive and lasting, which involves the elaboration and implementation of Community policies involving structural changes to the economy and society, to ensure the contemporary development in terms of impartiality towards future.

Policies on rural areas, namely the rural and agricultural development, both in Member States and in those that want to join the European Union, have embraced the principle of sustainable development.

This paper aims the approach of sustainable rural development elements at the level of the mountain areas from the North Eastern Romania Region of Development, based on factor analysis involved in this: the stabilization of population in the mountain rural areas, by eliminating or reducing rural exodus, struggle against poverty alleviation by encouraging and enhancing the work force, promoting equal opportunities for all mountain rural residents, improving quality of life and general welfare by preserving, protecting and improving environmental quality and rural mountain landscape.

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Material and methods

Methods and techniques that will be used in the developing of this methodology will be based on documentation and data from field research conducted at the local authorities, communities and households in mountain rural areas, also through collaboration with institutions both in N-E region profile of Romania and another region from The European Union which already made big steps toward sustainable rural development in the mountain areas.

The methodology will use diagnostic analysis of sustainable rural development aspects from the mountains areas of the development region; will identify existing resources and how they are recovered now.

It will also be assessed in the basis of social survey and economic potential, opportunities and problems of the region. The collection of data, information and formulation of ideas, assumptions and conclusions will be done through questionnaires and interviews adapted to this specific region.

The SWOT analysis will structure the collected data in order to show strengths, weaknesses, opportunities and risks assumed by sustainable rural development in the N-E mountain areas of Romania and will be conducted diagnostic tests to base development solutions for the region, starting from the objectives of the region's rural development strategy for the specific mountains area.

Results and discussions

The methodology proposed by this paper aims the approach of sustainable rural development elements in the mountain areas, at the level of North East region of development.

In terms of content, the methodology is structured in four parts:

- A first part in which is made a scientific documentation to develop a model of strategic planning at regional level in rural mountain areas, to be based on SWOT analysis type and then synthesizing rural characteristics and dimensions of rural development in the developing of the North-East region of Romania;
- A second part, such as applied, first held in a region with an advanced stage of rural development in another mountain region from The European Union, which will subsequently be used as a model in conducting SWOT analysis of the region of North - East from Romania;
- A third part of synthesis, which aims to formulate proposals on the objectives set out in the strategy of strategic planning for N-E region as well as suggestions for its improvement, based on analysis carried out;
- A final part that wants the spread of results to directly concerned factors in sustainable rural development of the mountain areas from NE region of Romania

Analysis of sustainable rural development, the growing region in N-E of Romania will have to determine precisely the main issues facing rural communities in this area.

This will be done by a diagnosis on what currently exists in this region, which will highlight the overall problems of the region and will open the way in developing sustainable scenarios for long-term sustainable development in rural areas.

Diagnosis will be achieved by developing a set of SWOT analysis, specific to all the size that sustainable rural development in the mountain areas has.

Once established this diagnosis can then proceed to the elaboration part of regional rural development strategies for the mountain areas, that aims the achieving of balanced socio-economic in the region analysed level and the creation of decent living conditions for rural population.

The methodology aims to contribute to the objective achievements in sustainable development strategy for the N-E region of Romania and will take account of rural development policy in the European Union, which has changed considerably in recent years, the meaning of the transition to a system pursuing integrated rural development.

Sustainable rural development of N-E Romania is a topic of great interest because of the new scientific and technological trends that will profoundly affect the mountain rural areas in the coming years.

For the next period can be estimated additional pressures on the rural environment, but also the emergence of rural development opportunities, especially as the N-E region of Romania has a high socio-economic potential in the rural mountain areas.

Diagnosis of the mountain areas from the N-E region of Romania requires consideration for all sizes involved in rural life: the social dimension, economic dimension, political dimension, technical-scientific dimension and dimension for environmental and natural mountain resources.

Part of the historical province of Moldavia, Romania's northeastern region is the most populated region in the country and has the lowest regional GDP per capita is Romania, about two-thirds of the national average.

The North East development region is an area where history, culture and tradition are present and complement the natural environment especially attractive.

Due to lower costs and better-qualified workforce, the North-East Region is one of the best areas for investment in The European Union.

The main attractions in the Northeast Region are Carpathian Mountains covered with alpine forest and rich in flora and fauna, famous painted monasteries from the fifteenth and sixteenth century protected by UNESCO, salt mines and spas that has therapeutic use, national parks and natural reservations, fishing lakes and other local tourist attraction.

Table.1 - North-east development region – Areas, population, cities, communes and villages

Counties Names	Total Area (km²)	Population	Number of cities	Number of communes	Number of villages
Bacau	6.621	721.411	5	85	491
Botosani	4.986	456.765	5	71	333
Iasi	5.476	824.083	2	93	418
Neamt	5.896	567.908	3	78	344
Suceava	8.553	705.730	11	97	379
Vaslui	5.318	456.686	2	81	449
Total	36.850	3.732.583	29	505	2414

Source: *INSSE, Romania*

Sustainable development is a process that must be analysed multisectoral, being necessary to take into account not only economic changes but also how to adapt human behaviour and social structures for rural specific.

More rural development cannot be sustainable unless it is adapted to the biophysical conditions and resources of the region considered. Therefore will be considered the decisional factors (politics) must participate in any development in strategy for rural development.

Sustainable development of N-E region should be considered in close connection with technological innovations, such as biotechnology and the Internet that can make major changes in rural areas.

Analysis of the social dimension will consider that the rural development bases are people. If the rural mountain space from a particular region (as there was in fact in N-E region) suffers a massive migration of young people to the city or a large number of farmers have over 65 years is very difficult to realize short-term a strong growth.

The social dimension must involve a diagnosis on the level of education in the rural mountain population from the region, their cultural identity and social structure.

The human factor is relevant not only looking at in terms of rural land, but also if we analyse in terms of the impact that the urban area has on lifestyle in rural areas.

May be relevant elements that rural areas have borrowed from the city for the spending of free time and the way of food.

Economic dimension analyse. Sustainable rural development can be achieved only in the context of achieving real economic growth in rural areas. Specific features characterizing the agriculture makes this branch of the economy to know the highest level of subsidies from the state, which had developed in recent year a complex intervention system, adapted to that prevailing in EU countries.

However the rural environment is characterized by a modest level of income achieved by the active population, which cannot ensure, in most cases, only the minimum subsistence

conditions. This requires analysis of the particularities of the mountain region in the N-E Romanian region of development, from the economic point of view, in order to find alternative activities (handicrafts, agro-tourism, non-agricultural activities) that can bring additional income for the rural residents.

Scale analysis referring to the environment and natural resources. In the long term rural development is possible only if this does not affect the depletion of natural resources and ecosystems. In fact the concept of sustainable development arose over just 30 years ago in response to the emergence of environmental and natural resource crisis, in particular those related to energy.

So the rural mountain region of N-E Romania should be realised in the circumstances ensuring water quality, prevent soil pollution, air and maintaining plant and animal biodiversity.

Unlike the urban areas where people can live and work in an artificial environment, rural areas highly dependent on natural resource conservation and maintenance of a healthy natural environment, allowing its specific economic activities.

The elaboration of rural development strategy for the N-E mountain development region of Romania should be made to prevent the impact it will have on the environment and natural resources.

The new economic and political concepts must be developed and implemented in close accordance with the promotion of biodiversity. The harmonization success of agricultural and environmental development can be achieved only through a systemic approach in environmental terms, in which scientific research must make an important contribution.

Should be considered the introduction of environmental criteria in promoting economic activities in rural mountain areas.

Political dimension analyse. Public input and involvement of significant social and economic groups in discussions regarding rural development priorities can help to choose the best strategy for rural development of NE region of Romania. It will consider trends and existing guidelines across the European Union, so that the objectives set out in strategy region development be made so as to combine the interests of residents and key political and economic persons in rural areas from the region, with priorities pursued at European level.

Rural development scenarios from the analysed region can be achieved only by taking into account the economic, social or environmental objectives, but also through evaluating the interests and political pressure. This will be done by analysing the existing balance of power between the main political factors of decision in rural development.

Technical and scientific dimension analyse. In recent decades all economic sectors have been affected by the jar rhythm that scientific and technical progress registered. Neither rural environment makes any exception in this chapter, even if the process of assimilation of technical- scientific progress has a lower dynamic to urban environment.

Achieving the objectives in the rural development strategy for the N-E region of Romania will have to take into account the application impact of new discoveries in the plant sector, biotechnology, animal husbandry and food industry. Among questions to be answered is located the one which will determine which of the new technologies will have a greater impact on rural development from the region.

New technologies of information transmission play a significant role in some sectors of rural economy, such as for example agro-tourism or direct marketing of agricultural products. Therefore it should be considered which of these are more important in the context of rural development from the considered region in a coherent strategy.

Using SWOT analysis as part of strategic planning in sustainable rural development is a modern research approach which seeks to be a novelty, at least about the region in which will carry the research theme.

Conclusions

Using SWOT analysis as part of strategic planning in sustainable rural development is a modern methodology approach which seeks to be a novelty, at least about the region in which will carry the research theme.

The methodology aims to contribute to the objective achievements in sustainable development strategy for mountain areas of the N-E mountain region of development from Romania and will take account of rural development policy in the European Union, which has changed considerably in recent years, the meaning of the transition to a system pursuing integrated rural development.

Diagnosis of the mountain area from the Romania Northeast region of development, requires consideration for all sizes involved in rural life: the social dimension, economic dimension, political dimension, technical-scientific dimension and dimension for environmental and natural resources.

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MOUNTINOUS REGIONS AND AGRICULTURAL POLICY IN SLOVENIA

*Tomaž Cunder*¹

Abstract

Due to varied natural conditions, a considerable share of agricultural land in Slovenia is situated in the less favoured areas (LFAs). From the spatial as well as social, agrarian and political points of view they are an essential segment of structural development. The long-term objective of the agricultural and social policy towards the LFAs areas is the preservation of functional ability of these areas. Compensatory allowances considerably contribute to income of farmers in specific areas. In connection with basic criteria of good farming practice, the measure contributes to preservation of agricultural land as well and therefore improves also the environmental functions of LFAs.

The prepared paper briefly outlines theoretical arguments for introducing of EU comparable LFAs policy and examines the implementation of accompanying measures in Slovenian agricultural policy. The paper is based on desk research drawing from responsible literature, legislation documents and available research studies

Key words: *agriculture, less favoured areas, sustainability, compensatory allowances*

Introduction

The fact is that LFAs are marginal, mostly removed from major economic centres and are characterised, due to their natural attributes, by more difficult living and economic conditions. From the spatial as well as social, agrarian and political points of view they are an essential segment of structural development. The long-term objective of the agricultural and social policy towards the LFAs areas must be the preservation of functional ability of these areas (MKGP, 2006). According to the principles of the eco-socially balanced development, the objectives of production-uncoupled compensatory allowances in the LFAs are the following:

- continuation and preservation of land use,
- maintenance of a viable rural community,

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- preservation of countryside,
- maintenance and promotion of sustainable farming systems,
- assurance of farming in areas with specific handicaps.

A difficult terrain, high altitude, unfavourable climatic and pedologic conditions, remoteness and difficulty of access are the most important factors that a considerable share of agricultural land in Slovenia is situated in the LFAs. While unfavourable conditions for production do not completely hinder farming, they are a cause of the lower production capacity of farms, the narrower selection of cultures and production orientations, and costlier production. Mountain farms are less competitive and, because of specific natural conditions reflected in the structure of agricultural land use, also less adaptable. Despite lower production potentials these areas nevertheless play a significant role in the preservation of the rural population and the cultural landscape, and in the maintenance of the ecological balance.

The main objectives of the presented paper are:

- to analyse the principles of current LFAs policy in Slovenia and to expose the crucial points of policy support in Slovenia and EU,
- to carry out critical assessment (evaluation) of current RDP measures with special emphasis on its consistency and reconciliation with identified needs, aims and means,
- to point on possible consequences – positive or negative – of reformed policy on economical, spatial and environmental structure in Slovenia.

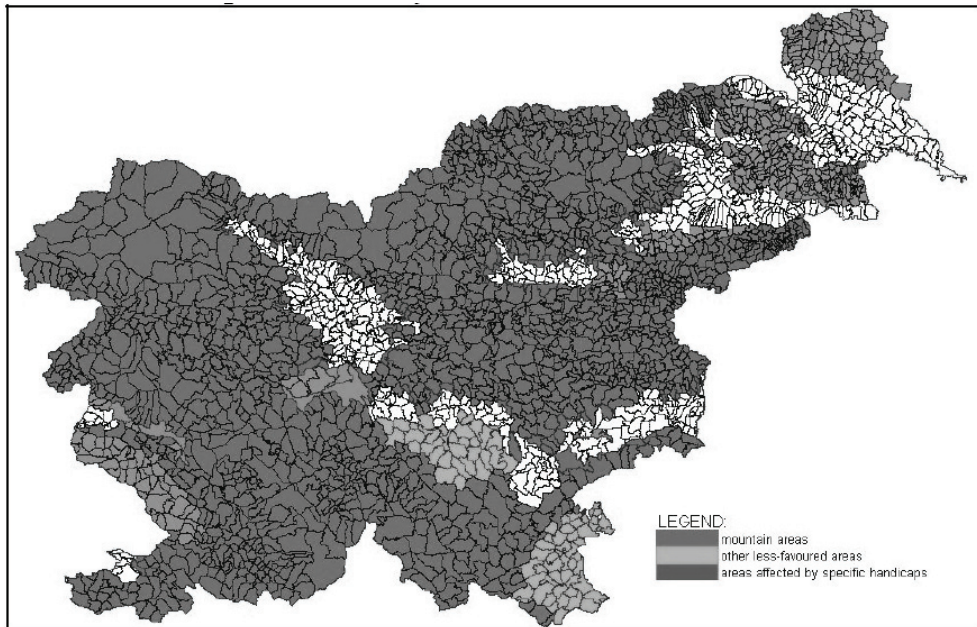
Delimitation of LFAs in Slovenia

Difficult production conditions place Slovenia among countries with the most difficult production conditions in Europe. More than 70% of agricultural land in Slovenia is located in areas where production conditions are somehow limited, which has a significant influence on the competitiveness and adaptability of the Slovenian agriculture.

In terms of their natural, production and socio-economic conditions Slovenia classified the following LFAs (Cunder, 2007, 2):

- mountain area,
- other less favoured areas,
- areas affected by specific handicaps.

Basic territorial unit for delimitation of LFAs is the cadastral community. Cadastral communities for Slovenia are part of the cadastral system since the land cadastre was established. The whole territory of the Republic of Slovenia is covered by a total of ca 5,190,600 land parcels, forming 2,698 cadastral communities. Cadastral community is a basic unit for managing Land Cadastre, each is marked with official name and identity number and is also spatially identified. The smallest unit of the cadastral system is cadastral parcel, which is linked to the cadastral community. They have been continuously maintained through the whole period, nowadays managed by Geodetic Office of Slovenia and are representing one of the basic GIS data.

Picture 1: Map of LFAs by cadastral communities in Slovenia

Source: Rural development plan for the republic of Slovenia 2007 - 2013

In compliance with the European legislation, **mountainous areas** are areas with considerably limited possibilities for land use and expensive use of special mechanization. Because of high altitude the vegetation period is shortened and in combination with steep slopes in the mountain area prevents use of machinery and narrows the possibility of selection of suitable crops. At lower altitude, where steep slopes appear, the inclination prevents the use of normal machinery and requires the use of very expensive special equipment. The handicap at lower altitude is therefore equivalent to the limited land use possibilities on higher altitudes. The definition of the mountain areas respects both criteria for delimitation of these areas which are: high-altitude and inclination. For evaluation purpose the data of altitude and inclination from “digital elevation model for Slovenia” 25×25 m were used.

Mountain areas in Slovenia shall meet the criteria of:

- average altitude of at least 700 m or
- average slope of at least 20%; at least 50% of the evaluated area has to meet the criteria of the inclination (bigger water tables are excluded from evaluation)
- or
- simultaneously average altitude of at least 500 m and the average slope of at least 15%.

Mountain areas cover about 72% of the territory of Slovenia and include mountain range of Julian Alps, Kamniško-Savinjske Alps, Karavanke, Pohorje and additionally also slope hilly area in central Slovenia.

Other LFAs in Slovenia present the area which is in danger of land use abandonment and

where maintenance of agricultural activities is necessary for countryside conservation. These areas are homogenous in natural production conditions and combined with bad demographic criteria in comparison to national average. These areas are characterized as predominantly agricultural, but poor soil productivity prevents the land for intensive production or improved without excessive investment.

For the purpose of evaluation of other LFAs the following data were used: (1) data of categories on agricultural land, (2) data on cadastral income and (3) demographic data on population density, population growth, and share of agricultural population in total population.

Other LFAs cover about 4% of Slovenian territory and they are located mainly in 2 regions (Bela krajina and Suha krajina).

The **areas affected by specific handicaps** are geographically unified areas where farming should be continued to ensure conservation of the environment, maintain the countryside and preserve the tourist potential of the area. The total sum of all areas delimited in this group in Slovenia shall not exceed 10%. These natural handicaps are exceptional and make agricultural production extremely difficult in the areas extremely difficult of limited. In Slovenia the following specific handicaps are defined: frequent flooding, strong North wind (burja - bora), Ljubljana marsh, Karst and "soft erodible hills in central and eastern part of Slovenia".

All together the areas with specific handicaps, in which agriculture has to be preserved as the main activity for conservation of the landscape in Slovenia, cover 10% of total territory.

Table 1 - Scope of LFAs in Slovenia according to the EU classification

Type of area	Total land		Utilised agricultural area (UAA)	
	000 ha	%	000 ha	%
Mountain	1.467.240	72,3	328	54,2
Other LFAs	81.200	4,0	23	3,8
Areas with specific handicaps	202.480	10,0	98	16,2
Total LFAs	1.750.920	86,3	449	74,2
Outside LFAs	276.370	13,6	156	25,8
Total Slovenia	2.027.300	100,0	605	100,0

Source: Rural development plan for the republic of Slovenia 2007 - 2013

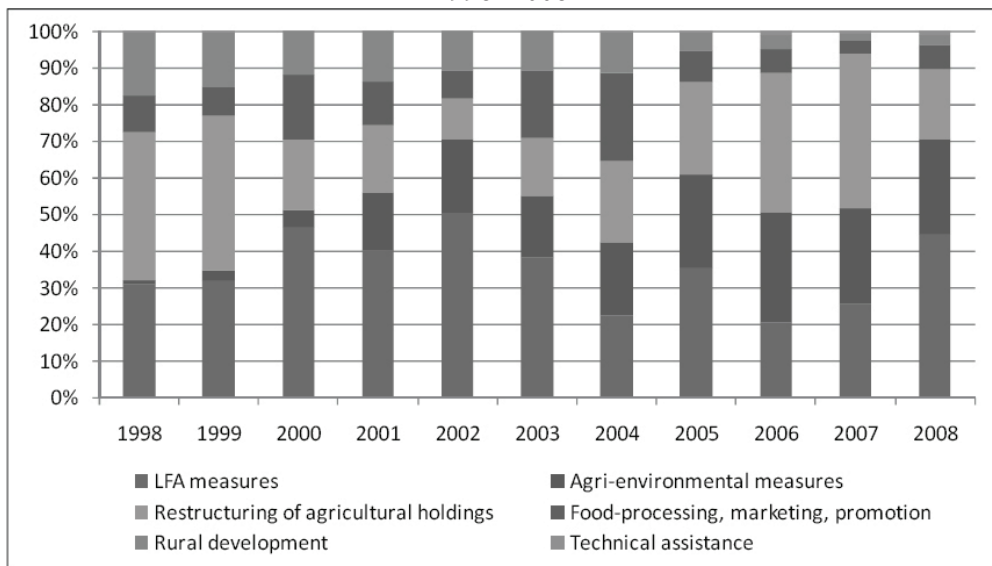
Compensatory allowances

Compensatory allowances are an important part of the Common Agricultural Policy. These schemes play a particularly important role in the environment where the natural and structural attributes, for example in the Alpine regions, do not promote

competitive agricultural production. Agriculture, however, has other public functions. The programme of market neutral payments, which serve to the multifunctionality of agriculture and rural areas, promotes a suitable cultivation of agricultural land and environmentally sound technology. In this way, aspects of agriculture that are socially important services but are not measurable in terms of the market, such as the maintenance of the population density, cultural landscape and the environment have been recognized.

In 2003, Slovenia began to implement the EU comparable compensatory allowances scheme in LFAs in compliance with the EU and a national regulation. There was no essential difference between the general objectives of the Slovenian and the EU agrarian policy with regard to the promotion of the LFAs. In both cases, these areas are worse off than the flat areas; structural policy is adequately adapted and measures are intended above all to equalise the differences, which occur due to the different conditions for management of these areas.

Picture 2: Share of expenditures for individual groups of RD measures in the period 1998 -2008



Source: MKGP, KIS, 2009

Measures for strengthening the sustainable and multifunctional farming in LFAs are financed through public expenditure, where 80% of funds are co-financed from the European Funds, while other 20% are provided by the national budget. In the year 2008 around 44% of whole rural development fund was focused on the priority "Preservation of agricultural landscape in less favoured areas".

For the areas referred to special delimitation, different amounts of compensatory allowances were introduced. The level of compensatory allowances depends on the classification of agricultural holdings into one of the classification categories with EP 2010 (57) SI – 2 (39-47)

regard to delimitation of LFAs and environmental characteristics of individual area. For the purpose of differentiations of payments, calculations were made by Agriculture Institute of Slovenia (Cunder, 2007, 3).

The difference in the costs of production “between sub-areas” within LFAs were calculated in the study entitled “Costs of agricultural production in different LFAs”. On this basis the actual level of compensatory allowances in LFAs are structured in greater detail.

The essentials of the study were:

- The level of the compensatory allowance per hectare for specific crops should provide that the own price of the product produced in less favourable conditions equals the own price of the product produced in favourable conditions.
- Differentiation of payments was defined in a simulation model with various production factors to determine the probable differences at the level of economic indicators.
- The analysis of production costs and the impact of different factors, which are typical for production in LFAs, on production costs has shown that the differences in costs for individual crops are substantiated enough if the following two indicators are used as criteria for different cultivation conditions: (1) intensity of production (yield quantity) and (2) the potential productivity of human and machinery work (possible use of machinery in production). The impact of these two factors on costs is significantly different for specific crops. The level of costs also depends on the type of agricultural land use.
- In the case of Slovenia, the level of necessary compensatory allowances for LFAs has been defined on the basis of a model matrix calculation. It has taken into account the current criteria for the definition of LFAs and the available data of agricultural land use. Agricultural land was classified under the individual elements of the matrix according to altitude (four classes) and inclination (six categories). Categories were identified on the basis of analysis of use in LFAs and analysis of trends of costs for specific products in difficult production conditions. Representative calculations of costs were made for different crops: potatoes, wheat and corn and for grassland - hay, silage and pasture.

The total levels of necessary refunds per hectare for specific areas were obtained by multiplying the average weightings for individual crop (weighting of difficulty level and land use) with initial costs.

Table 2: Compensatory payments for LFAs in Slovenia; 2004 - 2008

	EUR/ha		
	2004	2006	2008
Mountain areas	185,0	201,6	183,5
Alpine pastures	185,0	201,6	183,5
Steep slopes	158,1	172,4	156,8
Karst areas	158,1	172,4	156,8
Hilly areas	130,1	141,8	129,0
Different unfavourable conditions	63,8	69,5	63,3
Basic payment	25,6	25,3	25,0

Source: Poročilo o stanju kmetijstva v RS (Agricultural report), 2009

According to the data of Department for sustainable agriculture by Ministry of Agriculture, Forestry and Food 43.452 of agricultural holdings received compensatory allowances to cover production costs in the year 2008. They are representing 70 % of all in the payment scheme included farms in Slovenia. Of the total of 320.000 ha of agricultural land, which was claimed in subsidy applications, more than a third (35.3%) of the land is located in the mountainous/high-altitude area, which received most of the allowances (43.1%) (MKGP, 2007).

Expected economic, environmental and social impact and evaluation of current measures

Slovenia prepared LFAs measures according to three basic strategic orientations recognised in EU: (1) competitiveness, (2) sustainability and (3) multifunctionality. Although the agricultural production itself has a decreasing role in Slovenian LFAs, the increasing importance of agriculture has to be stressed by its multifunctional character. The functions of agriculture extend from the narrowest function of food production to the socially important functions of landscape cultivation, opening of space and promoting its management in the context of the economy, strategy and ecology. The basic condition for this activity is the sufficient population density of the rural area.

Table 3: Positive benefits of LFAs measures and comparison with agri-environmental measures

	economic	spatial	social	environmental
LFA measures	++	+++	+++	++
Agri-environmental measures	++	++	+	+++

Legend: High: +++; Medium: ++; Low: +

Both, compensatory allowances and agri-environmental measures are expressed by their positive economic, spatial, social and environmental function in LFAs. They considerably contribute to income of farmers in specific areas. In connection with basic criteria of good farming practice, the measure contributes to preservation of agricultural land as well and therefore improves also the environmental functions of LFAs. The measures have a positive social impact on sustained presence of farmers in areas with lower population density.

Agri-environmental measures have definitely a positive impact on the environment, whether by decreasing the negative influence of agriculture or through maintaining the current state. They are aimed at long-term improvement of natural resources in Slovenia. Agri-environmental subsidies partly replace the costs of extra work for fulfilment of specific criteria of each measure. Agri-environmental measures have also a positive effect on improvement of skills and qualifications for the implementation of sustainable agricultural practices (Cunder, 2007, 1)

Conclusions

A successful implementation of the LFA scheme in Slovenia in period 2007-2013 depends of many items including administrative structure, provision of information, monitoring of progress, integration with other policy objectives and the financial resources available. Scheme which is prepared under EU comparable regulations have multiple objectives regarding environment and landscape. However, it also has some economic and social objectives, which often bring competition between different policy interests. The rural development objectives might not be fully achieved in the case when measures are taken without sufficient coordination with other CAP measures. A careful monitoring effort - also by introducing rural development indicators, are needed to asses incentive payment schemes for their success in achieving of planning objectives and their effectiveness as policy instruments.

LFAs measures, involved in Slovenian rural development programme, could be effectively implemented only in the situation(s) where the following policy aspects can be ensured:

- further promotion of “non production” functions of agriculture in Slovene mountain areas,
- complete integration of agriculture inside the current political system, programmes and occurrences,
- assurance of quality-environment as a basis for sustainable economic development,
- adoption of long-run agricultural, social, regional and ecological policies.

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BIOFERTILIZERS IN THE FUNCTION OF SUSTAINABLE DEVELOPMENT

Gorica Cvijanović¹, Gordana Dozet², Danica Mićanović³

Abstract

The concern about the conservation of natural resources is present in almost all countries today. In the past, environmental protection has been reduced to the protection of nature only, through the protection of plants and animals in the protected areas. Through the development of both technology and environmental consciousness process of improving the environment in all areas has become accepted. Simultaneously the methods and guidelines for the process have been defined in the world as well as in the EU. Commitment of the Republic of Serbia to join the EU means adopting system oriented documents regarding the protection of the environment, organic food production and “soil health” protection.

The research is focused on the implementation of biofertilizers as alternative or supplement of mineral fertilizers in crop production, which would ensure the economical production while maintaining a stable yield and environmental protection in the system of sustainable agriculture.

The results of this research show that biofertilizers can be successfully used for the protection of the environment and food production, and as such may encourage rural development.

Key words: *system measures, organic farming, biofertilizers, soil*

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Introduction

During the last few decades, the environmental protection has become a topical issue, being a multi-, inter- and trans-disciplinary field and including environmental protection, pollution prevention and monitoring. Intensive industrial and technological development in the second half of the 19th century led to the first integrated international activities in the field of protection of the environment and ecosystems. After World War II, in 1948, an international conference was held in Fontainebleau, during which the International Union for the Protection of the Environment (IUCN) was established (Teodorović, 2008). Ecological starting points are mainly interconnected and related to securing the non-renewable resources and conservation of biological diversity. The importance of biodiversity protection has been particularly emphasized by the adoption of the Convention in Rio de Janeiro in 1992. This Convention, with its basic standards and guidelines, has become the basis for adoption of legal regulations for all the Member States of the European Union, as well as those intending to join the EU.

So far, the EU has adopted over 200 individual regulations relating to water, air and land pollution, waste management, protection measures imposed on chemical industry and biotechnology, products' standards, environmental impact assessment and the protection of the sea.

At the EU level the general framework of environmental policy is IPPC (*Integrated Pollution Prevention and Control*), given by 96/61EC Directive adopted by the Council of the European Union upon the proposal of the Commission of the European Communities in 1993, was called. Due to the inputs used to achieve maximum genetic yield potential of cultivated plants, agricultural production has transformed into in agri-industry, thus becoming great polluter of natural resources. In such production the most vulnerable area is soil, as the primary means of producing food and fiber. For these reasons, the International Federation of Organic Movement for the production of IFOAM (*International Federation of Organic Agricultural Movements*) was founded in Rio de Janeiro, aiming to facilitate production and processing of food in ecological production management system that promotes and enhances biodiversity, biochemical cycles and biologically active soil. Based on standards and guidelines issued by the IFOAM, the EU adopted the 2092/91 Directive, as well as Codex Alimentarius, which defines international standards for organic production according to FAO and WHO definitions.

Commitment of joining the European Union that has become a policy of the Republic of Serbia, implies the adoption of the system documents compliant with the EU regulations, regarding the protection of the environment. These were the reasons for the Assembly of the Republic of Serbia to establish laws controlling the discharge of pollutants in all environmental spheres, rational use of fuels and resources, as well as measures to ensure the rehabilitation of sites after the cessation of work activities (as is the case in surface coal mining) in late 2004.

Also, the law on organic production and organic products (Službeni glasnik RS, 62/2006), which defined modes of production, processing, transportation, storage and sales of organic products was adopted in 2006.

In order to prevent soil contamination in the agricultural production in the Republic of Serbia, a Regulation (Sl. Glasnik RS 78/2009) which defined maximum allowable amounts of heavy metals in the soil as well as the maximum amount that can enter the soil through processes of fertilization has been adopted (California Code of Regulations, 2001). It became clear that natural resources are not unlimited and that there is a real need to harmonize food production with rational use of resources, so that pollution of environment and agro-ecosystems are reduced to a minimum. (Lang, 1994).

In Serbia, some forms of organic production take place on about 6000 ha, and there is about 9000 ha in the transition process, adding up to only 0.3% of the arable land. This is obviously insufficient area to produce enough food to feed the nation. In addition to that, the agricultural financial subsidies are by far insufficient. This has encouraged many experts and manufacturers to seek ways and methods that can reduce production costs e.g. the cost of all agricultural products, so that their very products become competitive in the domestic and global food market (Cvijanovic, D. *et al*, 2001, 2007).

One of possible ways is adjusted use of mineral nitrogen fertilizers by means of biofertilizers (microorganisms that have the ability to fix atmospheric nitrogen). This way the soil chemisation as a form of fertilization it being reduced, soil biogenicity is preserved, biological cycles are encouraged, and finally the financial investments in production are reduced.

These requirements have directed the research, aiming to determine the impact of various fertilization systems and methods on some parameters important for the soil preservation.

The use of biofertilizers in organic production

Soil microorganisms are the largest group of soil organisms, very heterogeneous and making soil a complex and dynamic system. The number, activity and diversity of microorganisms is considered a significant indicator of potential and effective fertility of the soil. Therefore, the application of microbial inoculants either as biofertilizers, stimulants or phytopathogen biological control agents in food production meets the concept of sustainable agriculture: yield stability and quality and preserving the ecological balance, which has great influence on both, the food health safety and the economic outcome. Biological nitrogen fixation involves the application of effective microorganisms (which fix atmospheric nitrogen, such as *Rhizobium/Bradyrhizobium*, *Azotobacter*, *Azospirillum*, bacteria from *Bacillus*, *Pseudomonas*, *Nostoc*, *Anabaena* geni and mycorrhizal fungi) as inoculates that increase soil biological activity and quality of crops and vegetables (Milošević & Jarak, 2005, Cvijanović, G., 2006, Mićanović, 1997). Mixture of effective microorganisms does not contain genetically modified species but only those normally live in the soil and form an integral part of the microbial niches. According to Babeva and Zenova (1989) between 160 and 190 kg of nitrogen per ha is fixed in the biosphere by the process of biological fixation. Their use can reduce the amount of mineral fertilizers; can affect the microbial processes

that may indirectly express favorable effects on the biogenicity of soil and economic outcomes. Also, using biofertilizers can increase the amount of organic matter in soil.

The importance of organic matter in soil can be observed from a biological point of view. The content and the condition of organic matter in the soil both depend on the activity of microorganisms that simultaneously participate in two different processes, decomposition of organic matter and synthesis of hummus matter. The potential production soil capacity could not be achieved without the participation of micro-organisms (Cvijanović, G., *et al*, 2008). The method of diazotrophs inoculation is underused, because of the need to perform the strains selection according to the genotypes of the plants.

The influence of biofertilizers on basic parameters of soil biogenicity

Microorganisms act as indicators of all changes that occur in the soil, because their level of participation in total soil metabolic activities is at about 60-90%. Their biodiversity is considered the best indicator of potential and effective soil fertility as well as soil degradation. The total number of microorganisms has long been taken as an indicator of the state of the soil. The numbers of *Azotobacter* are important indicators of changes in the soil. *Azotobacter* is the most common kind of associative nitrogen fixing bacteria living in rhizosphere. They are very sensitive to all changes in their habitat, to which they strongly react by population number changes and enzyme activities, therefore are used as reliable indicators of the soil conditions along with the total number of microorganisms. Soil enzyme activity is also a good indicator of the oxidation reaction in the soil or hummification or dehumification processes of organic matter.

During long-term research (2005-2007) at the location of Zemun Polje, on poorly carbonated soil type, the inoculation of corn seed FAO maturity group 700 with associative biofertilizers was (*Azotobacter chroococcum*, *Azospirillum lipoferum*, *Brijerinckia Derox*, *Klebsiella planticola*, *Vineland Azotobacter*, *Pseudomonas Bacillus Bacillus magaterium subtilis*) carried out, at fertilizing level of 80 kgN.ha⁻¹. During the period 2008-2009, on degraded soil after completion of surface coal exploitation at the Lajkovac site, experimental seed inoculation with associative biofertilizers (*Azotobacter chroococcum*, *Azospirillum lipoferum*, *Azotobacter vineland*) was performed with the fertilization at 90 kgN.ha⁻¹. The study showed that an increase of basic soil biogenicity parameters at the location of Zemun Polje after inoculation, ranging from 3.51 to 7.94%. The same parameters at Lajkovac site shown far greater increase (101.4-18.38%), which correlates to organic matter content of these two soil types, since greater number of parameters were found in chernozem, when only mineral fertilizers were used.

Soil enzyme activity also increased after the seed inoculation at both locations, somewhat less at Lajkovac site (60µgTPF.g⁻¹soil) but with higher percentage increase (328%) than in Zemun Polje (481µgTPF.g⁻¹soil, 9% increase), which indicates the increase in the overall biodiversity of soil microorganisms.

Table 1. Effects bacterisation and fertilisers on parameters of biogeny soil in rhizospheres maize

Lokalitet	Fertilisers kgN.ha ⁻¹	Total number of microorganisms		Number of <i>Azotobacter-a</i>		Dehydrogenase activity	
		10 ⁷ .g ¹ soil	Index level	10 ¹ .g ¹ soil	Index level	µgTPF.g ⁻¹ soil	Index level
Zemun Polje	80 kgN.ha ⁻¹	153.80	100	168.21	100	438	100
	80kgN. ha ¹ +biofertiliz	159.20	103.51	181.50	107.94	481	109
Lajkovac	90 kgN.ha ⁻¹	106.29	100	93.30	100	14	100
	90kgN. ha ¹ +biofertiliz.	214.04	201.4	110.45	118.3	60	428

The results obtained indicate the compatibility of the selected nitrogen fixing species in the inoculums, because seeds bacterisation improved the growth, reproduction and enzyme activity of diazotrophs introduced, which caused an increase in numbers and enzyme activities of autochthonous microbial communities, and provided a good basis for assessing the productive capacity of soil. Biofertilizers introduced to soil cause changes in microbial communities, which compete for space and energy. Those changes are more pronounced during the extreme hydro-thermal conditions. Under the assumption that agro-meteorological factors would be at their average annual values, these results indicate a possible increase in corn yield.

The impact of the biofertilizers inoculation, show the same effect on corn grain protein content and the applied amount of mineral nitrogen. For its high energy content, corn is most used in animal nutrition both in the world and in Serbia. Although the maize proteins are deficient in two amino acids (lysine and tryptophan), they still make about 20% of the total protein in the mixtures, so the ways of their increase are of great ecological importance.

These results show that the bacterisation caused an increase in total protein content in maize grain. In average, the increase for all fertilization levels was 9,22%, and in the variant with bacterisation total protein content was 9.59%, which is very important, because the protein content in maize grain range from 6 to 12 % (Table 2).

Table 2. Effects of bacterisation on total proteins in maize seeds

Mode bacterisation	Proteins	Fertilizers level kgN.ha ⁻¹				Average
		0	80	120	160	
Inoculated	%	8,87	9,44	10,07	9,98	9,59
	Index level	110,32	108,00	109,10	109,19	109,22
Un-inoculated	%	8,04	8,74	9,23	9,14	8,78
	Index level	100,00	100,00	100,00	100,00	100,00

	LSD 5%	LSD 1%
Inoculationx **	0.176	0.269
	LSD 5%	LSD 1%
Inoculationx Fertilizers**	0.188	0.274

Apart from possible application of associative nitrogen fixators in the production of non-leguminous plants, the application of symbiotic nitrogen fixators in soybean production is a legally regulated measure. It can be said that the soybean production has taken its deserved place on the sowing areas in Serbia. Since 1991 in Serbia, the area planted with soybeans was about 45 530 ha, showing tendency of growth (Hrustić *et al*, 2002). The largest area under soybean to date was 157 000 ha, during year 2006 (Miladinovic, *et al*, 2008). Soybean not only is the raw material for the growing number of products in human nutrition, but holds an important place in the development of organic agriculture concept. Soy is believed to be an excellent pre-crop, especially for winter wheat, and a good undercrop in the joint sowing (Kovacevic, *et al.*, 2005; Lazic *et al*, 2008).

Sowing soybeans as pre-crop, combined or stubble crop, according to FAO and WHO definition, is the way of production management that promotes the recovery of ecosystems including their biodiversity, biological cycles and methods that largely exclude or correct the use of inputs (Kádár, 2007). Its importance in organic food production comes from the fact that it has low mineral nitrogen requirements, thanks to its genetical determination to live in symbiosis with *Bradyrhizobium japonicum*, bacteria that fix nitrogen from the atmosphere. After they enter the soil, the extent of their propagation and relationships with the present microbes will vary. They stimulate plant growth exercising inhibitory effect on the competitive, pest and parasitic microflora present in spermatosphere and rhizosphere; enter competitive relationships for space and food with other microorganisms from the microbial community, which causes changes in the entire microbial community (Németh, 2006, Milošević, 2008).

Table 3. Effects of bacterisation and fertilisers on parameters of soil biogenicity in maize rhizosphere

Locality	Fertilisers kgN.ha ⁻¹	Total number of microorganisms		Number of <i>Azotobacter-a</i>		Dehydrogenase activity	
		10 ⁷ .g ¹ soil	Index level	10 ¹ .g ¹ soil	Index level	µgTPF.g ⁻¹ soil	Index level
Zemun Polje	40 kgN.ha ⁻¹	53.7	100	188.5	100	443	100
	40kgN. ha ¹ +biofertiliz	150.2	279.7	278.7	147.8	474	107.1
	60 kgN.ha ⁻¹	38.6	100	191.7	100	433	100
	60kgN. ha ¹ +biofertiliz.	105.1	272.3	292.9	152.8	525	121.2
Lajkovac	90 kgN.ha ⁻¹	28.6	100	58.4	100	113	100
	90kgN. ha ¹ +biofertiliz	90.8	317.5	93.9	212.2	174	153.9

Conclusion

Based on the results of this research, it can be concluded that in safe food production systems, the inoculation of corn and soybean seeds by compatible species of bacteria that fix nitrogen from the atmosphere can be successfully performed, thus reducing the need for mineral nitrogen in quantities of about 60-90 kg N ha⁻¹. This measure should be taken into account with special care, especially in the case of soils contaminated with excessive use of mineral nitrogen fertilizers and the soils that are in the process of biological recultivation. Introducing nitrogen-fixators to the soil stimulates growth of useful autochthonous microbial population whose metabolites participate in the processes of creating and maintaining organic matter in soil as well as in soil phytopathogens control.

Creating associations with roots and using root exudates for their own metabolic processes, they increase their biomass and activity, thus increasing the biogenicity of soil. This intensifies the circulation of the essential elements and therefore makes the necessary supply of plant nutrients better.

This certainly is important in terms of ecology and economy, and therefore provides an opportunity for rural development through agro-tourism and ethno-production of safe food.

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PRODUCTION POTENTIAL OF BIO-ENERGY CROPS IN MULTIFUNCTIONAL AGRICULTURE AND RURAL DEVELOPMENT

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Abstract

*Bio-energy crops are grown with the specific purpose of utilizing their parts or the whole plant mass for the production of liquid or solid fuels, as an alternative to fossil fuels. The use of traditional bioenergy crops (straw of cereals and wood mass) and common field crops (for ethanol and bio-diesel) are considered. Promising for such utilization are also various species of annual and perennial grasses, among which miscanthus (*Miscanthus × giganteus* Greef et Deu.) is especially recognized as a source of good quality biomass. Only the intensive use of the existing and new energy crops could bring about a greater multi-functionality of agriculture, as well as comparative cost/benefit stability of agriculture and encourage the rural development.*

Key words: ethanol, biodiesel, wood mass, miscanthus

Introduction

Plant biomass represents a stored energy which may be utilized if necessary as fuel in power plants and in heating systems. It is a substitution for fossil fuels and it has a potential to decrease CO₂ emission and thus influence the decrease of global heating produced by the greenhouse effect. Utilization of this energy is favorable for the environment because it originates from continually renewable energy sources.

The main stimulant for the development and spreading of bio-energy crops is introduced through the ratification of the Kyoto protocol (1997) concerned with climate changes and the decrease of gas emission and the greenhouse effects. The great global interest in bio-fuels may be explained by the fact that they represent a potential

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that decreases a country dependence on the import of oil derivatives, decreases CO₂ emission, contributes to the development of rural communities economy [15]. Ideal heating crop should have appropriate potential for taking up, keeping and conversion of available solar energy into the harvest biomass with maximal efficiency, minimal inputs and minimal unfavorable environmental impacts [7]. The systems for cultivation of the crops for biomass must have very favorable (positive) energy balance, i.e. low energy inputs in comparison with the output, considering that inputs imply utilization of fossil fuels and CO₂ emission into the atmosphere. Cultivation, harvest and especially nitrogen fertilization, represent high financial and fossil fuel inputs [7].

Traditional bio-energy sources

Traditional bio-energy sources are represented by the straw of various agricultural crops and the woody mass. Due to their high productivity (appropriate yield of the dry matter per the surface unit and per year) and due to their high potential for CO₂ substitution, the utilization of crops as solid fuels is interesting. The whole crop, as well as the individual fractions of grains and straw may be utilized for combustion. However, high concentrations of Cl, K and N in the crop biomass are serious drawbacks in their utilization as solid fuels [9]. On the other hand, big rolled bales of soybean straw, give very satisfactory combustion quality [14]. The quality of the biomass may be significantly improved by adding coal and other additives and it may be used as such for certain types of boilers with low level of pollutant emission, primarily of SO₂ emission [20].

About 7% households in Serbia utilize wood as heating fuel [15]. Forest plantations with great number of plants (short rotation coppices) which represent a uniform, locally available raw material of fast growing deciduous wood species, are widely promoted. The plantations consist mainly of densely planted willows or poplars, which are harvested usually each 3 years. The root remains in the soil after the harvest and next spring new sprigs emerge from it. By the direct combustion of the biomass, by shredding or chipping of the whole trunks, together with the bark and branches, a significant level of heating energy may be achieved.

Under the environmental conditions in Serbia, the clones of eastern cottonwood (*Populus deltoides*) were found to be the best: they have a comparatively high volume mass and a high increment of wood mass, in comparison with the clones of Euro-American poplars [10]. In combination with appropriate planting densities, with necessary biological cultivation and protection measures, all necessary conditions may be fulfilled for the establishment of so-called energy plantations from renewable natural sources [10].

The remnants of fruit-trees or grapevine cuttings may also be utilized in original form, as a fuel. The quantity of the cut biomass is primarily dependent on the fruit/grapevine species and on the cultivar characteristics [23]. However, under the conditions in Serbia, the gathering, processing, preparation and utilization of the cut plant remnants did not find a wide application, because the cut remnants are

characterized with substantial moisture, variable composition and voluminous form, and thus with low volume mass, which causes a low rationality of the transport as well as an impaired manipulation, storage and utilization in furnaces [23].

Utilization of agricultural crops as bio-energy fuels

Maize is the main raw material for the production of ethanol. Consumption of ethanol, as an alternative fuel, is constantly increasing. Our country, which is one of the big European maize producers, has very good predispositions for ethanol production [18]. With common agricultural crops, the most important quality feature is the starch content in the grain. It should be higher than 70% in order to obtain 37-40 l of pure ethanol per 100 kg of maize. Beside maize, commercial production of ethanol from potatoes and sugar beet is also possible. The price of the ethanol obtained by maize processing, for instance, varies between 30 and 60 USD, in dependence of maize price [1].

In Serbia, rapeseed represents the main raw material for bio-diesel production. In the global market, beside rapeseed, sunflower, soybean and palms are the most frequently represented bio-diesel sources. Germany is the country with the highest bio-diesel production [15]. Bio-diesel has better lubricity than sulfur-free mineral fuels. Two very important advantages of bio-diesel in comparison with mineral fuels are: quick biodegradation and a significantly lower emission of harmful particles and gases during motor combustion.

Promising new bio-energy crops

A great number of investigations have been carried out worldwide, mostly of grasses as potential energy crops. Various species of annual and perennial grasses, characterized with high biomass yield, high efficiency of nutrient and water utilization and good quality biomass combustion, turned out to be very promising for utilization. Perennial grasses that produce aboveground mass every year may have higher yield than cultivated forest plantations. Also, the existing forest economy machines may be used for their cultivation [7]. The species that are most convenient for cultivation and have the highest bio-energy yield are [5]:

- switchgrass (*Panicum virgatum* L.),
- reed (perennial) Canary-grass (*Phalaris arundinacea* L.),
- giant reed (*Arundo donax* L.) and
- miscanthus (*Miscanthus × giganteus* Greef et Deu.).

In Europe, the most frequently cultivated and widely spread is miscanthus, a very high C₄ grass, with a potentially high yield, but also with high requirements of nutrients and moisture. Miscanthus plantation is long-standing (15-20 years) and it is harvested each year since the end of December till the beginning of April. The caloric value of miscanthus biomass does not depend on irrigation or nitrogen fertilization. Energy production depends only on the yield biomass [6]. Miscanthus straw has good combustion quality, and because of the specific characteristics, it is convenient for

briquetting [13]. With the current fuel prices, the miscanthus crop will be profitable if it is grown for 4 or more years, even without subsidies [7].

Contrary to annual species, perennial crops (primarily coppices with short rotation and perennial grasses) require only one cultivation activity, i.e. the preparations for planting. During the next 10-20 years, nitrogen inputs for perennial crops are minimal. After the harvesting of the plant material, it is combusted directly. The energy waste for the production of the crops is minimal. The input/output ratio in these systems may be even lower than 0,2 [12]. In fuel production from annual crops (ethanol from maize or bio-diesel from rape) the input/output ratio is $\geq 0,8$ [12,22]. Thus, the prospect of the development and spreading of these bio-energy crops will depend primarily on the fluctuation of prices in the market (mostly of fuel prices, cereal prices and the level of governmental subsidies), as well on the specific technical requirements of the cultivation of these crops [5].

Ecological problems and the profitability of bio-energy crop cultivation

Although the contribution of bio-energy to the total energy balance is still negligible, an advanced development and bio-energy crop spreading are obvious [5]. In connection with the “boom” of bio-fuel production and consumption, the critics stress potential social problems and costs connected with the environment including the consequences of food price increases [15]. In the beginning, it was recommended to cultivate biomass crops on the plots unfavorable for food crop growth [16]. According to official statistics, Serbia has enough abandoned and unexploited land, which could be used for cultivation of those crops, without decreasing the existing arable areas [15]. However, it is already evident that, for instance, miscanthus could be profitable if grown on some highly productive land plots convenient for wheat production, too [3].

Because of this, the advanced development and spreading of bio-energy crops are exposed to severe criticism and doubts as to their validity and commercial justification. The basic problem is the identification of the most convenient biomass and the construction of the process for energy extraction from it. Actually, the process of energy production will probably not be profitable with some biomass types, which are potentially energetically available, because energy consumption for their cultivation will not be compensated [1]. Not to mention that the total bio-fuel price is still high. Obstacle for the successful production is also the problem of competition with conventional crops, due to a high production cost and the need to occupy the arable land plots for a long time interval.

In the countries of EU zone, bio-energy cost/benefit depends on financial subsidies for all crops, except for the crops grown for direct combustion of biomass for heat production [4]. The utilization of energy plants in EU will not decrease substantially the food crop production, but it could induce higher prices of agriculture products [4]. An increase in income from agriculture could be expected in the future, because agriculture is increasingly connected with the development of primary energy cost, i.e. the increase of energy cost must increase the prices of agriculture products [4]. Also, energy production

that is occupying the place of agriculture production does not open new jobs.

For large-scale commercial bio-fuels to contribute to sustainable development will require agriculturally sustainable methods and markets that provide enhanced livelihood opportunities and equitable terms of trade [19]. On the other hand, the results indicate that the application of highly efficient agriculture systems, in combination with geographic optimization of land utilization, may decrease the area necessary for the global food production till 2050 to almost 72% of the existing area [21].

Bio-energy crops and multifunctional agriculture

The main function of agriculture is food production. Multifunctional agriculture implies performing of other, primarily commercially justified functions useful for the community. Actually, the production of energy by cultivation of appropriate bio-energy crops may contribute significantly to the building of multifunctional agriculture in the countries like Serbia. The current comparatively marginal impact of bio-energy crop is being gradually surpassed by a continual growth of bio-fuel production and thus by increasing of the participation of the areas under bio-energy crops in the total area under agricultural crops.

The interests concerning bio-fuel production are contradictory. Besides, external factors may exert the crucial influence on the development of national bio-fuel programs [11]. Bio-energy may yield a positive contribution to climate issues and to rural revitalization. However, if not implemented successfully it may worsen the soil and water degradation, as well as ecosystem degradation. It may also reduce food production safety and increase the emission of greenhouse gases [19]. Because of this, the aim of energy management policy must be focused on the decrease of energy consumption, introduction of new energy sources, increase of the extent and the quality of agriculture production and the lower environmental pollution; i.e. lower production costs [8].

Stimulation measures of the Government focused on the production and application of bio-fuels in Serbia must be well calculated, because they bring the advantages: decrease of oil import, decrease of the emission of greenhouse gases, opening of new jobs, increase of good quality forage supply, cultivation on currently abandoned plots. Pejčinović and Delić [17] mention the following support mechanisms, which are of significance for utilization of renewable energy sources: stimulation fees, obligatory quotas, tender system, invested subsidies, tax reductions and a so-called “green price system”.

It may be concluded that only intensive utilization of the existing and new bio-energy crops, their great potential may be materialized and the multifunctional agriculture may be advanced, as well as a comparative price stability, which will stimulate a long-term rural development. However, the benefits that bio-energy crops contribute to rural development will probably depend on the region involved. Namely, the variations of potential yields and production costs may be great, both at the national level, and within individual regions [2].

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IMPLEMENTED METHODS IN EXTENSION PRACTICE FOR NEW PRODUCERS/FARMERS IN ORGANIC PRODUCTION

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Abstract

Reorientation from conventional to organic and other controlled types of ecological production requires a more systematic approach and the multiple knowledge of different areas encompassed by these types of production. The introduction of organic production represents a multiphase process, where a producer must master technical, technological, economic, legal and ecological aspects of production. The need for services provided by an extensionist in most European countries represents a norm which significantly contributes to the increase of the number of certified producers. In our conditions, such an approach in extension practice has been initiated only recently. To be more precise, in the shape of their planned activities, the expert team of the "Tamiš" Institute, Pančevo has created a method of extension practice, which was used on the occasion of the introduction of organic production to producers.

Key words: *method of extension practice, period of conversion, organic production, certificate, production technology*

Introduction

To engage in agriculture has always been tied with a certain amount of knowledge and capital (8), and that stands as one of the basic preconditions in today's circumstances of market economy. In Serbia, in the period so far, the trainings and education of doing organic production have generally been executed through various international projects. The executed projects encompassed certain regions, circles and people (4). The result of this kind of engagement was the transfer of theoretical knowledge to a narrow circle of people, chiefly concerning general information on organic production, and less about technical, inspection and marketing information. In connection with the mentioned need for further education concerning practical

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knowledge about organic production, in late 2008, the expert team of the Research and Development Centre of the Institute "Tamiš" (14), through the activities of its extension service, began with active engagement for the purpose of promotion and spreading of organic production on the South Banat area.

The improvement of farm production as a goal of an extension process actually means the change of attitudes, ideas, and thus, the change of the ways farmers act. These changes are made possible as a farmer acquires new knowledge, technologies and skills that make it possible for them to solve problems in certain aspects of farm production. The task of an extensionist is to facilitate this process, so, as the basic mechanism of transferring necessary knowledge and skills, the extensionist uses certain methods of extension practice (3). The informing and education of producers, manufacturers and consumers about the production and advantages of organic products, their effect on health, as well as the building of the credibility in the system of certification, are necessary conditions for the development of a market of organic products in Serbia. Also, for the purpose of easier export of organic products from Serbia, it is necessary to adjust the legal regulation in the field of organic agricultural production to the regulations of the EU (1). The existing legal regulation does not allow certifying agencies to provide consulting services. Therefore, with their activities, extensionist contributes to the promotion and development of organic production.

The aim of this paper is to draw attention to the importance of complementary implementation of extension practice methods on the occasion of the introduction of organic production to conventional producers.

Possible reasons for the introduction of organic production

According to FAO data from 2009, the total organic production in the world is currently taking place on 32.2 million hectares, with a noticeable trend of the increase of the areas (14). In the world, there is currently 3.0% of soil reserved for organic production, which is present in this country with symbolic 0.3%. The tendency of growth in the world is 25.0% each year, whereas in this country, according to certain sources, as much as 80.0% of agricultural soil could be certified. Without a three year conversion, it would be possible to switch as much as 20.0% of soil to organic production (5).

According to the data of the Ministry of Agriculture, in 2009, the total area on which the methods of organic production were implemented amounted to 2,875ha, of which 488ha are registered as certified areas, while the other areas are in the period of conversion. Although the cultivable soil under organic production has grown by the annual rate of 20% in the past few years, its share in the total agricultural area is still low, given the natural potentials that Serbia has (source: The Quality Group of the Ministry of Agriculture, Forestry and Water Resources, 2010). Based on the elementary ecological principles – caution and prevention, as a part of multifunctional agriculture, organic production allows revitalization and various types of production, the development of family farms and a happier life for rural families. That is particularly

important in Serbia, where 56% of agricultural farms have less than 3.0 hectares of soil, and 54% of Serbia's population live in rural areas. (2). Multifunctional agriculture opens the road to development for small and medium family farms where economic and ecological results are conditioned by knowledge, the creation of the conditions for various sales of food and non-agricultural goods and services, with the respect for hygienic, sanitary and esthetic measures and the code of behavior.

One of the possible directions of the further development of organic production is also provided by the National Programme for Serbian Agriculture, which has been adopted by the Ministry of Agriculture, Forestry and Water Resources for the period 2010-2013, in which this sort of production is classified as a programme aimed at the making of added value (11). In the Article 24 of the Regulation of Organization and Work of the Agricultural Extension Service of the Provincial Secretariat of Agriculture Forestry and Water Resources of the Autonomous Province of Vojvodina (9), it is indicated that The provision of expert advice is in connection with specific areas and demands on the part of producers, which are, inter alia, concerned with: organizational and other aspects of agricultural production; informing clients of measures of agrarian policy, subsidies, legal regulation; farm keeping, the making of business plans, the increase of incomes and the productivity and quality of production, the improvement of life standard and the raising of social and educational standards in rural areas, the conservation of environment, the association of producers, etc, by which is, in a certain way, included the extension practice at the introduction of organic production to producers.

As one of the goals of the National Action Plan of the development of organic production in Serbia, in the course of the following five years, an extension sector is planned, which would be easily accessible and market demand oriented extension sector, providing expert and contemporary support to producers, for the purpose of the development of organic production (10). In order to put the plan into practice, in the course of the year 2010 started the implementation of the project "The education of extensionists in the field of organic production", whose aim is the introduction of organic agricultural production to the system of expert extension services of Serbia (15, 16). The creation and implementation of the programme is, inter alia, participated by the expert team of the Research and Development Centre of the Institute "Tamiš", Pančevo, which have presented to the present extensionist their past engagement dealing with practical methods and techniques in organic plant production.

The method of extension practice on the occasion of the introduction of organic production to producers

In order to present the possibility of doing organic production to producers in the best light, on the occasion of the introduction of organic production, the first step was the observation of critical points on a farm, caution and inclusion (not at any cost). In this engagement, the importance and seriousness of decision-making about the embankment on organic production. The facts were presented that in the first two years we have had the drop of crops and the increase of investments, as well as a

greater engagement in mastering the technology and getting familiar with the market. Having learnt the conditions on a farm, in the cases where the conditions were marked as positive for the inclusion in organic production, together with the producer, we visited every parcel that was supposed to enter the process of conversion, as well as the household in all. On the occasion of determining which type of production to take, we have taken into account the past experience of the producer, the knowledge, tradition and characteristics of the community. The recommendation was to start with smaller areas. We pointed out the existence of any sort of processing in the household as an advantage for the inclusion in organic production. In the environment where there is no organic production, it was leaned toward the forming of groups of three producers, which, informally associated, enter this type of production system. The goal of such an approach was that group-organized producers more quickly and easily reach a larger number of certified products in order to enter the market (12). Also, one of the directives for the inclusion in this production was that producers start with the production of organic seed (11). The fact that it is negotiated production speaking in favour of that, and also in contact with participants, the conclusion was reached that there had been a constant lack of certified organic seed. By the implementation of organic production methods, biodiversity is preserved and improved through the introduction, preservation and improvement of autochthonous and less present species and materials. This sort of approach requires incessant planning and multidisciplinary. We pointed out the Internet as a means of informing and advertising, and trained the producer for the making of a site before getting the product from the period of conversion.

The existence of demo-field by the methods of organic production on the demo-field of the Institute "Tamiš" is the foundation of our engagement, and is supposed to be of a long-term use for the research and development work, the performance of field experiments, experience gaining, the establishment of technology, and, based on that, the provision of recommendations (6).

As a result of this sort of approach in extension practice in the region of South Banat (7) in the period from the year 2008, five producers have been included in organic production. In the text to follow, we will set the profiles of the producers we have worked with.

Atanacković Farm, Crepaja (the second year of conversion period): Long-term producer of autochthonous food, food products prepared in traditional style. Products with characteristic organoleptic qualities are famous enough that they informally hold the title "Healthy food of Crepaja". By its system of work, Atanacković Farm represents a generator of the development of organic production in the broader territory of the residential area of Crepaja. Apart from crop products (the most famous is cold pressed sunflower oil) and the production of the organic seed of black soybeans, in this household can be found mangulica meat and meat products and various poultry eggs.

Marionc Farm, Crepaja (the second year of conversion period): Hardworking producers of vegetables and crop products have been present in Belgrade market for several years now as farm managers whose products have well recognizable appearance, scent and taste. Their main orientation is the production and improvement less present

plant species and their processing in controlled conditions with certified production. Apart from the offer of different vegetable species, in their product programme, they have soybeans, beans, blue corn, wheat, meat and other pork products.

Krčadinac Farm, Crepaja (the first year of conversion period): Young and respectable conventional producers who have recognized the advantages of organic production. On their parcels, they grow cereals, red cabbage, black soybeans (seed production) and beans. In the period to follow, the enlargement of the area and the number of plant species is planned.

Belča Farm, Dobrica (the first year of conversion period): The household whose primary activity is the production of soybeans, corn, sunflower, honey and other bee products, as well as the production of eggs, chickens, poultry and turkey meat. The plan of this farm is the improvement of the environment where they live. Through associated acting, they want to promote the residential area of Dobrice through the offer of several autochthonous products under the brand name "Dobrica u srcu" (Dobrica in heart).

Velja Farm, Dobrica (traditional producer): The long-term orientation of this household is the production of soybeans, corn, sunflower and the production of livestock food for the needs of the production of eggs, chickens, poultry and turkey meat. In association with other locals, they will work on the presentation of so far little known products originating from Dobrica.

Apart from the individual producers, in the past periods, contacts were established with several subjects from the territory covered by the Institute "Tamiš" concerning the engagement in organic production (the Beekeeper Society "Bagrem" from Alibunar, "Galus – Soyafod" from Lokve, "Zrnco" from Kovačica, etc), as well as with several firms out of the mentioned region (Secondary School of Agriculture "Vršac" from Vršac, "Bio farma" from Belgrade, "Budućnost" from Čurug, etc).

The facts which, in our opinion, hinder the development of organic production

In the period to follow, for the purpose of establishing, organizing and functioning of organic production, it is necessary to resolve the following deficiencies and problems:

1. The lack of applied research work.
2. The lack of profiled extensionists for sustainable agriculture.
3. Payment for control and certification.
4. Delays on the occasion of certificate issuing.
5. The non-existence of complete and clear organic legislation.
6. The non-existence of transparency and the "slowness" of bureaucracy.
7. The lack of organic seeds, as well as the non-existence of a database of the available organic seeds.
8. The lack of the means for plant protection and strengthening, as well as the bureaucratic slowdown of the adoption of the positive European list of the mentioned means.
9. The lack of manufacturing activity and the ignorance of the technology of the conservation and processing of organic products.

Conclusion

The tendency of the contemporary agriculture is the increase of the inclusion of the sustainable ecologically acceptable systems of production, so agricultural production, in good part, moves towards the production of organic food. Organic food, in its production, needs the maximum involvement of knowledge, through a complete management and through a complete cost control.

Our experience has shown that the role of everyday work is of great importance for the introduction of organic production to producers. Cooperation with individual farms and firms that have chosen organic production required a lot more intensive extension practice, given all the specificities of this production. As a result of such work, a method has been created, which facilitated the very process of the inclusion of producers in organic production. Through interactive work, the producers we have worked with accepted advice, and, working with them, solving various problems, we, as extensionists, have also reached new knowledge and progressed.

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POSSIBILITIES ALTERNATIVE GRAIN PRODUCTION IN THE HIGHLANDS AREA OF CENTRAL SERBIA

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Summary

Two-year investigations of possibilities production of alternative grains (buckwheat, quinoa, triticale and spelt) were carried out at five sites hilly-mountainous regions of Serbia. These are around Valjevo in western Serbia, Nova Varos and Pozega in southwestern Serbia, in Kucajna village (municipality Kucevo) and Zajecar in eastern Serbia. Results from experimental fields in Stara Pazova (Srem) served as control. The alternative grains are grown using standard agricultural technology used in commercial production. Mineral fertilization and crop protection with pesticides are not carried out. Weeds are suppressed by hand during vegetation period.

The largest grain yields per unit area were obtained on the test trials at soil chernozem type in Srem. However, the results achieved in less fertile soil on hilly-mountainous regions of Serbia and changed agroecological conditions indicate that these plants can be successfully grown in less favorable conditions for agricultural production.

This is of particular importance for small rural households, which would changing the sowing structure significantly increase the production per unit area as an alternative grain products greatly appreciated to make high-quality and healthy food.

As the demand for these products continue to rise on the world market, we should look for an opportunity for improvement of our rural areas where there are natural resources for the production of these field crops.

Key words: *alternative grains, buckwheat, quinoa, triticale, spelt, hilly-mountainous region.*

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Introduction

Crop production of mountainous regions of Central Serbia is characterized by growing traditional field crops in the system of semi intensive to extensive usage of agricultural land. Therefore, yields and total agricultural production, so small that the unfavorable weather for years do not meet even the needs of their own holdings. The reasons for this kind of use of arable land are numerous, mainly small and fragmented land, poor agricultural mechanization and equipment prevailing elderly households. Another reason is the presence of crops that can not be achieved major gains per unit area, especially as the farming products are not in the best way. Traditional production of the most abundant crop plants the right grain of wheat, barley and oats, or corn for grain production often does not meet either the needs of the household as the yields of these products run from the use of inadequate agrotechnics systems.

Improving the general condition of crop production in highlands areas without major investment in cultural practices can be achieved by modifying the sowing structure. So, instead of winter wheat, with yields on poor soils and the application of inadequate nutrition of plants do not exceed $3,000 \text{ kg ha}^{-1}$, inadequate nutrition of plants do not exceed $3,000 \text{ kg ha}^{-1}$, should be sown any other rights of wheat that are better adapted to environmental conditions in these areas. These are triticale, spelt wheat and naked oat spelled or right grain, which, due to the high nutritional value, in today's increasingly being used directly as human food or to produce food products that are categorized as functional and safe food. Changing cultivars of corn would significantly increase overall agricultural production.

Rather than dent corn hybrids for grain should be grown for the production of hybrids concentrated silage. Dent hybrid or flint hybrids should occupy a larger area because the grain or flour is increasingly present in the human diet. Triticale is increasingly used in the diet of all species of domestic animals because it has more nutritional value than other true grains (Đekić et al. 2009). Buckwheat, our traditional plant species of mountainous areas, due to its high nutritional value, it is common in preparing different meals at home, but also raw materials for production of semi-finished and finished dishes. In addition to these grains in the production should be introduced and for us a new alternative grains (Stallknecht et al. 1996). One of these grains is quinoa, a plant that was brought from South America and already in some European countries because it is grown for food to be greatly appreciated. By its food and grain quinoa digestible values at the level of wheat and the weight loss are more valuable (does not contain gluten).

The aim of this researching was to determine the most appropriate alternative grain production technology in hilly and mountainous region of Serbia with the use of existing agricultural mechanization. The results were compared with production in Srem in the vast natural soil fertility.

Material and method

The subject of research is finding the optimal technology of alternative grain buckwheat, quinoa, triticale and wheat spelt in the mountainous region of Serbia. Research has had a comprehensive nature, since it includes four types of crop grown in the two-year period in the following areas:

- A. Western Serbia (Valjevo)
- B. Eastern Serbia (Kučevo, Zajecar, Pirot)
- C. Southwest Serbia (Nova Varos, Pozega)
- D. Test essay in the field of Srem (Stara Pazova Surduk).

Agrotechnic is adapted to each type individually and adapted to specific weather and soil conditions of the studied area (Panković and Malešević, 2006). During the experiment, the execution and analysis of agrometeorological and soil conditions at these locations. The research comprised phenological observations, and analysis of the dynamics of growth and development of plants during the growing season to determine the most suitable technology of production adapted to local environmental conditions. After harvest, crop yields were calculated per unit area and a certain quality of derived products. During the study were monitored and analyzed the most important meteorological parameters - the schedule and amount of precipitation and temperature conditions during the growing season of plants (Tables 1 and 2).

Table 1 Monthly and annual precipitation, mm

Place	Valjevo		Kučevo		Nova Varoš		Stara Pazova	
	2009.	2010.	2009.	2010.	2009.	2010.	2009.	2010.
1.	22	40	39	40	30	43	38	35
2.	12	42	25	51	27	38	33	38
3.	67	49	40	61	69	44	53	32
4.	25	37	17	54	23	60	16	55
5.	64	46	28	30	31	33	60	45
6.	118	86	98	64	113	72	115	68
7.	79	101	65	86	58	99	70	94
8.	59	55	37	45	66	58	44	67
9.	45	58	39	30	68	76	29	42
10.	18	-	41	-	22	-	25	-
11.	19	-	33	-	35	-	24	-
12.	38	-	28	-	8	-	26	-
Total:	556	514	490	461	550	473	533	441

Table 2 Annual Calendar of heat, °C

Place	Valjevo		Kučevo		Nova Varoš		Stara Pazova	
	2009.	2010.	2009.	2010.	2009.	2010.	2009.	2010.
1.	-1	-1	-1	-2	-2	-1	-1	-1
2.	-1	-2	-3	-1	-2	0	2	0
3.	4	6	4	5	4	5	6	8
4.	7	10	14	15	10	9	11	12
5.	14	19	17	19	14	14	17	18
6.	19	23	19	20	18	18	18	19
7.	23	22	21	20	20	19	23	20
8.	22	21	22	23	20	20	23	22
9.	16	19	19	19	18	19	20	21
10.	11	-	12	-	10	-	17	-
11.	7	-	8	-	5	-	9	-
12.	3	-	2	-	1	-	4	-
Average	10.4	-	11.5	-	9.7	-	11.6	-

The highest annual rainfalls were in western Serbia (556 mm). They were decreasing to the east of the republic. The least precipitation was in the experimental farm of Kucevo, 490 mm. Arranged by months were similar on all localities with distinct peaks in June and minimum in February. In quantity and distribution of natural water regime was equal to the water needs of plants in both years. Annual Calendar of heat is less varied by location and had a uniform distribution by month. Differences of the smallest (Nova Varos) to the largest average annual temperatures (Stara Pazova) were 1.9°C.

All data were processed with the statistical analysis for two factorial experiments. Locality of Srem (sample plots in the Stara Pazova and Surduk) served as standard of the research results.

Results and discussion

Grain yield. Results of two-year researching of the influence of agrometeorological conditions on the yield of buckwheat seeds, quinoa, triticale and Spelt showed that they significantly affect the success in producing these alternative grains (Table 3).

Table 3 Grain yield, t ha⁻¹

Place	Buckwheat*			Quinoa*			Triticale			Spelt*		
	2009.	2010.	x	2009.	2010.	x	2009.	2010.	x	2009.	2010.	x
A	0.91	0.72	0.82	-	-	-	4.62	4.36	4.49	-	2.92	2.92
B	1.22	0.67	0.95	0.62	0.73	0.83	4.46	4.84	4.65	2.96	3.11	3.04
C	1.33	1.31	1.32	0.73	0.65	0.69	3.00	2.45	2.73	-	2.71	2.71
D	1.54	1.77	1.66	1.55	1.79	1.67	4.89	4.39	4.64	3.78	3.98	3.88
x	1.25	1.12	1.19	0.97	1.06	1.02	4.24	4.01	4.13	3.37	2.48	2.93
LSD _{5%}	0.23	0.19	0.33	0.25	0.37	0.34	0.82	0.46	0.67	0.78	0.49	0.63
LSD _{1%}	0.56	0.47	0.83	0.63	0.91	0.83	2.01	1.13	1.64	1.91	1.19	1.55

A - Western Serbia, B - East Serbia, C - South West Serbia, D - Srem. * Skinned grain

The lowest average yield of buckwheat was in western Serbia 0.8 t ha⁻¹ and the largest in Srem, 1.66 t ha⁻¹. Significant individual variations were observed between the locations A, C and D, then the B, C and D and between B and C and C and D. The differences in yield weather conditions had no significant effect because the meteorological conditions in both years had similar values. Quinoa did not grown on site A and the lowest grain yield was the site of C 0.69 t ha⁻¹. In eastern Serbia, the average yield was 20% higher, but the differences were significant only in relation to locality D. The average yield of triticale at sites A, B and D was higher than 4.45 t ha⁻¹. On the south-western Serbia was significantly lower, 2.73 t ha⁻¹. These crops are grown here on the growing surfaces. The agrotechnic is adapted to the environmental conditions and land and achieve the high yield (Panković and Malešević, 2006). At the locality C on the decreasing of yield was affected the factors that were not included in the researching. Spelt was sown in the first year in B and D locality, and the second on all four location. Consistent average yield in the first three locations and significantly higher in the Srem showed that this corn should be grown in the mountainous region of Serbia.

That the yield of buckwheat has a strong influence of soil fertility have shown results on the effects of supplementary feeding of plants that cite Filipović et al. (2005), and applied technology of production system (time and method of sowing) to highlight Choi et al. (1990).

For us quinoa is unknown crop that was first sown in the trials, the 2008th year. First results show that in our climatic and soil conditions gives high yields (Glamočlija et al., 2009, and 2010). By comparison with results those obtained by Bois et al. (2006), it can be successfully grown at high altitudes because it is tolerant of spring frosts and drought (García et al., 2007). The yields obtained in experiments in different soil conditions suggest that the potential yield quinoa depends on the chemical and physical properties of soil. These results confirm research Jacobsen's (2003) with a large number of trials with a large geographical area. Triticale grain is an alternative that is in many traits (yield, grain quality, adaptability to different environmental conditions) exceeded the parental wheat and rye components. In the central areas of the republic at altitudes up to 800 feet triticale gives higher yields than other real grain (Đekić et al., 2009 and EP 2010 (57) SI – 2 (71-77)

2010). Spelt is a type of wheat that has long ceased to be cultivated in our country, but due to the increasing demand for flour of wheat (Zielinski et al. 2008), is involved in a program of research. The object of study is Nirvana, our first variety of spelt selected in the Institute of Field and Vegetable Crops.

Conclusion

Based on the results of these studies can be done the following conclusions:
- Grain yield in two-year study and compared with the best agricultural regions of Serbia show that highlands area has a favorable environmental conditions for the cultivation of alternative grains;

- Production and yields of triticale were uniform in all locations, indicating that local varieties are very suitable for growing on different soil types of highlands areas of central Serbia;
- Natural conditions in the mountainous area were favorable for the cultivation of buckwheat, so that the average yields were satisfactory compared with the test trials;
- Quinoa is, according to preliminary results showed good adaptation to the conditions of high humidity and the soil less natural fertility. Large yields obtained in the Srem showed that it has great potential for yield;
- Spelt is successfully grown in the highlands area. Therefore, in future this grain should be included in the structure of planting, primarily because the increasing demand for food products with a share spelled flour (bread, pasta);
- These, and other species that are currently underrepresented in our production, should be introduced into commercial production to meet the needs of the domestic food industry and think about exporting. Due to the fact that most of the agricultural areas of central Serbia away from the big polluters Urban Environment (large settlements, industrial plants, roads), fulfilled the conditions for organizing the production of alternative grains on the principle of ecological (organic) agriculture.

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Economics of agriculture

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ISSUES ON ORGANIC AGRICULTURE IN ROMANIA

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Abstract

It is important for Romanian agriculture and for the food chain system to collaborate in advantage of local agricultural producers and to expand the market for the Romanian organic agricultural products. The present situation of Romanian economy and agriculture is very favorable for the extension of the organic agriculture sector. There is a general sense of an ecological product in Romania, related to the good fate of the common-sense family, either placed in urban or rural areas. Romanian people know that, through Romania's integration in EU, the organic agricultural sector and the organic products and foods have favorable opportunities of valorization on the European market.

Keywords: *organic agriculture, market, organic products*

Introduction

Romania is situated in the South-Eastern part of Central Europe, inside and outside of the Carpathian Mountains, on the Danube lower course and opens to the Black Sea. The total area agricultural land of Romania is 14.800 million ha, out of which 9.283 million ha is arable land, 4.930 million ha pastures and meadows; 0.298 million ha are vineyards and 0.289 million ha are orchards. The arable land is about 0.43 ha/inhabitant. The Romanian climate is temperate-continental of transition, with oceanic influences from the West, Mediterranean influences from the South-West and continental-excessive influences from the North-East.

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Material and methods

Agriculture is an important sector of the Romanian national economy, with 28-35% of the active population involved in agricultural productive sectors and a contribution of 15-25% to the GDP. Rural space occupies more than 95% of the territory and agricultural space 62%. In Romania, there are approximately 240,000 ha for organic farming. Of this, cereals such as wheat, maize, sorghum, rye and millet make up more than half of the certified area.

Organic hay and animal feed crops are grown on 50,000 ha and industrial crops take up 22,000 ha. Organic apiculture produced more than 600 tons of bee products.

As Romanian organic agriculture is harmonizing its structures with the European and world standards, it is important for Romanian agriculture and for the food chain system to collaborate in advantage of local agricultural producers and to expand the market for the Romanian organic agricultural products. This can be achieved only with increasing assistance from the authorities that should create economic and legislative framework for a functional economy in general, and organic agriculture products and food availability in particular.

The present situation of Romanian economy and agriculture is very favorable for the extension of the organic agriculture sector. Romanian agriculturists are interested to produce marketable agricultural products and food for domestic and external market. Romanian people know that, through Romania's integration in EU, the organic agricultural sector and the organic products and foods have favorable opportunities of valorization on the European market.

Results and discussions

About 35 % of the soils have good and very good fertility, being suitable for a relatively wide range of culture, the fertility and biological activity of soils are maintained solely by products derived from animal farms; diseases, pests and weeds are mostly controlled by means of selecting tolerant or resistant varieties, providing an adequate crop rotation, by physical and mechanical means of control; the fodders for the animals are mostly obtained from natural grasslands on which no fertilizers or other synthesis products were used, the existence of varieties and hybrids created in Romania, adapted to the specific conditions, wide biodiversity, specific for pedo-climatic areas.

Organic products are mainly sold in urban areas where the target beneficiaries are families with significant income, as well as those educated in the concept of certified food products. An estimated amount of families consuming organic products in Bucharest includes about 100,000 families. Organic food tends to be sold more through specialized shops, in small neighborhood supermarkets where dedicated selling areas do not cover more than 3% of the total area per shop. Organic products could also be identified in supermarkets.

There is a general sense of an ecological product in Romania, related to the good fate of the common-sense family, either placed in urban or rural areas. Forty

percent of the Romanian population lives in rural areas while the rest has relatives in Romanian villages.

Traditional agricultural methods, still practiced on a wide scale in rural area are perceived as “ecological”, acknowledging the good sense of producing the agricultural produce without using intensive techniques. Therefore, even though not necessarily true, market agricultural products – artificially labeled as “Romanian” are considered ecological. This is true in most cases, provided that labeling respects the origin.

In modern thinking, this cannot be recorded as valid certified organic products. This means that changes must occur in the perception of what certified products mean. Imported organic products sold in Romania include a limited range of products (about 30 products), among which brown sugar, flavored milk, etc.

Figure 1 - Certified organic products



The internal production market of Romania is developing owing to a strange driving force, namely associated to the poverty of the average farmer and grows constantly in the range of products, together with the awareness of the farmers to establish market association, to keep certification costs low per farmer, awareness to enable them to negotiate better prices at the farm gate. Export is made particularly for raw products. Those are mainly associated with operators who could have afforded large investments in processing plants.

The marketing needs for the Romanian organic products are connected to the level of perception of the necessity to buy products from a trustful source. The internal market also needs grow in the purchase power of the average Romanian families. Spectacular changes in this respect are not expected to take place on short term.

In the case of exports, in close connection with the international market trends,

the organic sector of Romania must adapt its production, storage to the cleaning possibilities to the following link in the “organic chain” international transport. There is a clear requirement in Romania for the development of the intermediary operators such as whole crop purchasers, and cleaning and storage facilities. The progress in organic agriculture is, by its very nature of making use of local resources, dependent on knowledge of optimum local conditions.

Problems managing the selling of organic products are those of the adaptation of post harvesting system to following links of organic chain:

- relationship with selling procedures and operators;
- relationship with handling and transportation possibilities further in the chain.

All these must take into account the quality requirements underlined in the merchandise specifications. The capacity of good quality storage to increase access to better pricing over time seems to be crucial at farmers’ level. For farmers, it is important the income (income generated by selling of organic products) and the cost associated with the necessary inputs. Farmers will use more money during the conversion period before certification, and the modernization of facilities is expensive - especially for dairy and animal farmers.

On medium and long term, organic agriculture and rural development will play an essential role in the government's strategy that will provide high domestic food quality and sustainable and diversified production according to European safety standards. EU support agriculture and in specially, organic agriculture by direct payments, rural development (also including the reconversion of the labor force), and funds for market interventions.

Considering the demand of organic products from the foreign markets and the prices paid for these products, organic farming can represent an important source of money for Romanian farmers.

The institutional framework must stimulate and sustain the Romanian agricultural producers in developing this type of agriculture, because there is an important external demand and, in addition, through Romanian consumers’ education (which have the tendency “natural products” for the following reasons:

- they are aware of the importance of food safety and quality;
- they imitate the consumers behavior from EU member countries.

The increase of consumer demand for organic food has created opportunities for all sectors in the chain of production, distribution and marketing, which have contributed to an increase of the economic and social development of many rural areas in the EU. The annual growth of the market for organic products is 10-15%. Besides providing greater financial security of producers, processors, distributors and retailers of organic products, the economic benefits of this trend will inevitably have an effect on other businesses in rural areas and the whole rural community – both directly and indirectly.

Conclusions

In the conditions of EU integration, food industry has to meet some essential conditions too. Thus, the farmers and the companies within the entire technological food industry chain must adopt the rules and regulations that are specific to a common market and the EU agriculture policy and all the institutions involved in organic agriculture that will promote the organic agriculture principles.

Organic farming has a great contribution to a lasting economic development and plays an important role in the improvement of the environment, preservation of soil, improvement of water quality, biodiversity and protection of nature and may move ahead in the rural economy and make it viable by expanding economic activities with high added value and generate jobs in rural areas.

However, financial support should be given for stimulating organic farming initiation. This presentation represents an argument in the favor of the necessity to promote organic farming practice on large scale in Romania.

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ECONOMIC EFFECTS OF THE USE OF MOUNTAIN PASTURES FOR BREEDING OF HEIFERS¹

Sanjin Ivanović², Siniša Bratić³, Todor Marković⁴

Summary

In the Republic of Serbia, pastures cover more than 800,000 ha, while pastures and meadows together cover 1,428,000 ha, i.e. 27.97% of the total exploited agricultural land. However, economic effects of their utilization so far have not been sufficiently explored. The above mentioned areas can be successfully utilized for growing of heifers. Therefore, this paper lists the advantages and economic effects of the use of pastures for breeding of heifers.

Using the example of a family farm that utilizes modern technical and technological solutions in accommodating and feeding the cattle, it was determined that the costs of breeding reduce by 19.07% when exploiting pastures, compared to stable breeding. Different types of cooperation among the cattle farms are proposed particularly focusing on formation of farms specialized in breeding of heifers. Also, the paper lists the problems linked to the utilization of pastures, as well as measures that could contribute to their more effective use.

Keywords: *cattle production, feeding, competitiveness, territorial specifics, comparative advantages, costs*

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Introduction

A significant part of the Republic of Serbia, primarily its central and southern area, is dominated by hills and mountains, primarily used as cattle pastures in agricultural production. Over the last decade, according to the available statistical data (period 1999 to 2008), around 5,104,000 ha of land is used for agricultural production, with pastures making 828,000 ha or 16.21% of the total agricultural land.

The use of pastures greatly improves the cost effectiveness of the cattle and sheep production, and therefore the biggest number of cattle and sheep in Serbia is concentrated in the territory of central Serbia. The growing of cattle and sheep in pastures is closely linked to the production of bulky cattle food in meadows, covering the area of 600,000 hectares in Serbia, thus making, together with pastures, total of 1,428,000 ha, i.e. as much as 27.97% of the total utilized agricultural land. However, regardless of the good natural potentials for utilization of pastures, they are increasingly less utilized, due to the fact that the number of cattle and sheep is continuously dropping. This drop is the result of the negative price ratio between the agricultural and industrial products. The other significant reason for the reduction of cattle number is the unregulated agricultural market in Serbia and the inability to export to the countries of EU (**Ivanović, 2008**).

So far, a small number of researches have been conducted in Serbia, dealing with the economic effect of the utilization of pastures. This problem was dealt with by **Gogić (2004)**, who applied the method of calculation of the so-called processing price of the pasture grass in order to evaluate whether pastures are better utilized for growing of steers or sheep. Using the example of the family farm from Stara Planina area, **Gogić (2005)** tested the economic effectiveness and financial feasibility of investments in growing of sheep and steers utilizing pastures. Using family farms as an example, **Ivanović (2005)** studied how the use of pastures influences the milk production by milking cows. Certain researches on the economic effects of agricultural production in hilly and mountainous areas were also conducted by **Sorajić (1995)** in the region of east Herzegovina and **Bulatović (1999)** in the northern part of Montenegro. Pastures are mostly characterized by poor quality of grass cover, and yield is also at a low level. In the period 1999 - 2008, the average yield from pastures was 0.51 t/ha, with moderate yearly oscillations (variation coefficient 11.78%) and an insignificant growth rate (2.05%) (Source: www.stat.gov.rs).

In order to achieve highest possible financial gain from pastures (which are the main comparative advantage in the area of cattle production), breeding of the type of livestock that best utilizes bulky food (even that of poor quality) would be required, such as sheep and cattle. Comparing the production of milk and meat with these two types of animals in the period 1999 – 2008, significant differences can be noted. The average production of cow milk made for 99% of the total milk production in Serbia, while sheep milk made for just 0.99%. The differences are not as evident when it comes to the production of meat. Beef makes for the total of 19.80% of total meat production in Serbia, compared to merely 3.99% for mutton (source: www.stat.gov.rs). Having in mind the domination of cattle over sheep breeding (with respect to the volume of production of meat and milk), this paper will be dealing with the issues of utilization of pastures in cattle production.

Material and Method

Taking into consideration the natural potentials of Serbia, as well as the above mentioned previously conducted analyses and problems, the research subject in this paper will be the analysis of the potentials for utilization of pastures for cattle breeding, primarily breeding of heifers.

The paper will also point to the advantages and shortcomings to cattle breeding (breeding of heifers) in pastures and the measures required for optimum utilization of pastures. Apart from the comparative analysis, through the use of methods of analytical calculation will be calculated the economic effects of breeding of heifers in pastures. The analysis will be done on the family farms example, as they utilize over 90% of production capacities of the overall agriculture production in Serbia.

Results and Discussion

Cattle production includes three main breeding systems – pasture, stable and combined. Family farms in the biggest number of cases utilize the stable system, rarely the combined system, while the utilization of strictly pasture system in the Serbian conditions is almost negligible. The presence of specific breeding systems depends on numerous factors, such as the farm location (i.e. availability of pastures in the area), pasture quality, availability of labor for looking after the cattle in pastures, agrarian policy measures, etc. While in Serbia subsidies are used to stimulate classic milk production and cattle breeding, there are still no state subsidies that would influence the promotion of those types of cattle production that are fully based on utilization of pastures. As an example, we can mention the growing of specialized breeds of cattle, as well as the production of beef based on the principle cow – calf, first calf cow – calf, etc.

Stable system, the dominant system in Serbia, has numerous shortcomings – costs of fodder and costs of bedding significantly exceed the same costs of the combined system, the invested labor is higher, cows are more susceptible to diseases and have more problems with reproduction, etc. All these factors influence the poor economic effects of stable system compared to the stable-pasture system.

In order for the aforementioned shortcomings to be alleviated, in the period of summer feeding it would be desirable to use animal feeding plants produced in plowed land instead of conserved food. In this case, fresh cattle fodder is mowed and cows are fed in stables, and this continuous exploitation of green mass is called green conveyer (sequence). However, this form of provision of green fodder requires big organizational efforts in farms applying this system, because it requires high level of mobility of labor and mechanization. Apart from that, this form of feeding is dependent on weather conditions, since in the rainy period it is impossible to feed cattle with green mass due to inability to use mechanization in the plowed land. Another problem could also be the balancing of meals for cattle, having in mind that during the vegetation period different plants are grown with variable nutrition values.

The effect of all these difficulties is that increasing number of farms has began replacing green fodder with conserved fodder when feeding specific categories of cattle (cows and steers), although aware of all the advantages of green fodder (such as high level of digestion, minimum losses of nutritive substances, cattle likes consuming this food, it is beneficial to animal health and production). As an alternative source of

green food, green hydroponics cattle food can be used. This source of cattle food is represented in growing plants without using land, i.e. cereal in the initial growing stage. As it requires significant investments in facilities and equipment, this type of feeding has not gained momentum in our practice.

In order to demonstrate the effects of the use of pastures in breeding of heifers, i.e. the benefit of breeding them in pastures for at least one part of the year instead in stables, a relevant calculation of expenses was conducted per one heifer. The assumption was that heifers use pastures 150 days a year and that in that period there are no costs of silage and alfalfa, while the costs of concentrated food are the same as with stable breeding (because the quality of pasture is difficult to predict).

The paper makes the assumption that the heifers are insured from disease induced death or accidental death (as the basic risk), and also from the loss of breeding capability (as additional risk). Depreciation, maintenance and insurance of facilities and equipment were calculated under the assumption of using modern opened free type facilities. In that way the costs of facilities construction are reduced (compared to classic stables), the labor productivity is increased, and better effects to the health of the animals are achieved. Other parameters of the calculation were harmonized with the actual situation in the production practice. It was assumed that the heifers are taken care of during pasture season by the members of the household, and therefore these costs were not included in the calculation, but compensated from the farm profit. This kind of calculation can serve as the orientation when estimating the costs of heifer breeding service (for specialized breeders), because it doesn't include the cost of female calves involved into the breeding (table 1).

Table 1 Cost of breeding one heifer with and without pasture usage (RSD)

Calculation elements	In stable	In pasture
Fodder	71,494.50	55,267.00
Insemination	1,000.00	1,000.00
Veterinary services	1,000.00	800.00
Registration	3,000.00	3,000.00
Straw	7,300.00	6,570.00
Water	851.00	766.00
Depreciation of buildings	735.00	735.00
Depreciation of equipment	1,102.50	1,102.50
Maintenance of buildings	367.50	367.50
Maintenance of equipment	882.00	882.00
Insurance of heifers	2,500.00	2,500.00
Insurance of buildings	73.50	73.50
Insurance of equipment	110.25	110.25
Total for one heifer	90,416.25	73,173.75

Based on the data from the calculation, it can be concluded that by transferring from stable to the combined breeding system (stable-pasture) the cost would be reduced by 19.07%. The planned expenses pertain to the period of two years which is the length of grow of one heifer, from a week old calf to two years, when the first birth is expected. According to some estimates (**Milojić Miroslava (1989)**), around 40% of young cattle originating from milk production breeds will actually be used for milk production. These are mostly early maturing species that are made barren 14-16 months old, thus achieving higher production of milk during life period. This early insemination has become a standard in milk production.

However, since the breeding of heifers lasts approximately two years, the return of invested funds is delayed, thus burdening the finished products during cow exploitation period. One of important methods for rationalization of breeding, apart from the reduction of growing period, is the inclusion of quality yet cheap cattle food. According to **Krstić et al. (2000)**, in the structure of costs of growing heifers in large farms the cost of food takes 57.2% (the costs relating to calves are not included). In the analyzed example of family farms, the food contribution is even higher, because the costs do not reflect the labor costs of household members.

In Serbia, milk producers most commonly breed heifers in pastures, in order to reduce the costs. At the same time with breeding heifers for own needs, they can breed heifers for the market.

The other possibility is to form specialized farms that would do service of breeding heifers for a wider number of producers, similar to service of fattening steers that was very popular among producers for a very long time. This form of cooperation could especially work well between lowland and mountain farms (lowland farms providing good quality calves, mountain growing them and returning back at a specific gravidity period) thus bringing to the maximum territorial specifics and comparative advantages in securing all types of cattle fodders.

The cooperation can also be in following way – large farms transferring cows that are not in production phase or transferring young cattle to the mounting farms during the vegetation season and thus significantly reducing the costs of feeding. That would be a good solution when there is a disparity between the number of cattle in a farm and the capacity for production of bulky food. Having in mind that we are talking about sensitive production, all production and market conditions must be precisely defined among the relevant parties.

It is obvious that in breeding of heifers the use of pastures is extremely important because it greatly reduces the costs of production, both directly and indirectly. Direct reduction of costs pertains to the costs of cattle fodder, while indirectly costs of cattle production are reduced through the increase of labor productivity and improvement of health of cattle.

However, regardless of all the advantages of the use of pastures, there are certain problems linked to their utilization. As the use of pastures is generally free of charge, there are no financial funds available for their maintenance and nourishment. Therefore, the grass cover can be of poor quality, the grass mass yield is low and

extremely dependant on weather conditions during the year. In Serbia, most pastures are of natural origin, while artificial ones can be scarcely found.

Natural pastures in our country, according to **Pavličević (2001)**, are not satisfactory, neither by quality nor yield. He doesn't just see the reasons in the lack of agro-technical measures, but also in lack of their preparation and improper use. For the purpose of improving the effects of utilization of pastures, increase of yield and quality of grass cover is required, which can be achieved through division of pastures (through construction of appropriate permanent or mobile fences). The rotational grazing would contribute to better and more steadfast utilization of grass cover with the reduction of percentage of weed, it would enable higher exploitation of produced green fodder by 30% compared to free pasture feeding.

The pastures could be significantly improved by irrigation and fertilization with mineral fertilizers and manure (which would increase the yield), as well as the introduction of pasture-mowing system (improving the yield and quality of green mass). The improvement of quality of grass cover can be achieved by sowing quality grass species (this measure would contribute to yield increase and nutritive value of grass).

Regular spring or autumn preparation of pastures should include a wide range of measures, the most important ones being stubbing up of wattle, collection of stones and other waste material, removing of weed and molehills and regulation of watering places. All of the above listed measures would produce better results in artificial than in natural pastures. One should also bear in mind that, when it comes to artificial pastures, they should not be used for free but strictly for rotational grazing.

Conclusion

Having in mind the large areas under pastures (primarily in the mountain territory of central Serbia), the paper examines the potentials of their utilization in breeding of heifers. Therefore, an analytical calculation of breeding of heifers in a family farm was made, that demonstrated that the costs of heifers breeding reduce by 19.07% when using pastures, compared to their breeding in stables. Therefore, formation of specialized farms for breeding of heifers would increase the cost effectiveness of milk production even in those farms that are not in the position to use pastures for feeding of milking cows.

In order to improve the economic effects of the use of pastures, implementation of measures for improvement of yield and the quality of grass cover will be required, while special attention should be paid to the enlargement of areas under artificial pastures.

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MARKET AS A FACTOR IN THE DEVELOPMENT OF MOUNTAIN REGION IN MONTENEGRO

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Abstract

Available surfaces, relief, climate, soil and hydro highlight specific diversity of Montenegrin agriculture. Montenegro has a limited agricultural land (37.5% of the territory), arable land (36.6% or 0.3 ha per capita), and especially the area under arable land, orchards and vineyards (which are counted in the EU arable land), of only 58,262 ha or 0.09 ha per capita.

The hilly and mountainous region includes seven municipalities in northern Montenegro. Although this area is characterized by a significant share of nearly two fifths of total agricultural land and nearly so in total arable land in Montenegro (38.3%), one of the less developed region of Montenegro. The paper analyzes the current situation and perceived potential opportunities to improve this region from the market point of view.

Key words: *market, multi-functionality, the mountain area, natural resources.*

1. Introduction

Some of the features of the Montenegrin primary agriculture are: extensiveness, fragmented holdings, a relatively low level of marketability of production and low levels of self-sufficiency for huge number of agricultural products. In addition to growing some vegetables, part of the vineyards, farm production in fisheries and in cattle (milk production in the areas of organized purchase) and agricultural production has no market character of production yet. Montenegro is a net importer of food, with the outstanding balance deficit in the last ten years².

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2 Fundamental characteristics of development of the Mountainous area of territory belonging to the municipality of Žabljak, Kolašin, Mojkovac, Plužine, Pljevlja, Rožaje and Šavnik. These seven northern municipalities in Montenegro, along with municipalities Andrijevica, Berane, Bijelo Polje and Plav, consists of mountain agricultural zone, characterized by a developed animal husbandry, forestry, production of honey, herbs and river fish production.

Available natural resources and comparative advantages of mountainous regions contained primarily in the extraordinary natural resources and agricultural production (organic farming), are not used sufficiently. As one of the limiting factors for improving production in this area there are under-developed market relations and market infrastructure, resulting in coming to the fore and weak evaluation of the potential placement of food through the so-called tourist spending so called "*invisible export*". The current level of utilization of resources and the multifunctional character of agriculture in the analyzed area significantly beyond of its present contribution to development of Montenegrin agriculture.

This paper analyzes data relating to the movement of share of population and households in the total number at the National Level in the period 1948-2003 and the latest available information relating to all other observed data, (2003 the latest available census data and the 2008 and 2009 statistical year books).

2. Fundamental characteristics of development of the analyzed area

Analyzed area belongs to the municipality of Žabljak, Kolasin, Mojkovac, Plužine, Pljevlja, Rožaje and Šavnik. These seven northern municipalities in Montenegro along with municipalities Andrijevića, Berane, Bijelo Polje and Plav consists of mountain agricultural zone, characterized by a developed animal husbandry, forestry, production of honey, herbs and river fish production.

Seven municipalities mountainous district covers more than 1/3 of the territory of Montenegro. The movement of population and the number of households of the study area during the period from 1948 to 2003 year record of intense change. The most pronounced and almost identical decline in the share of the total population and number of households recorded in Šavnik from 2.0 (1948) to 0.5% (2003). Unlike Mojkovac that kept uniform level of participation and in the population and the number of households (1.6%), only the municipality of Rožaje recorded a larger share of the total population from 2.9% to 3.7% and total number of households from 2.1% to 2.8% (Table 1).

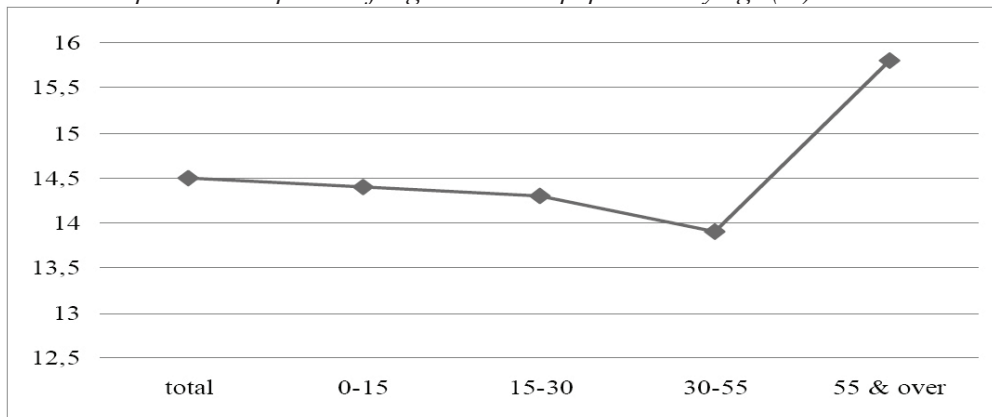
Table 1. The share of population and number of households of mountainous region in Montenegro

	1948		1971		2003	
	Population (%)	Households (%)	Population (%)	Households (%)	Population (%)	Households (%)
Žabljak	1,6	1,4	1,2	1,2	0,7	0,7
Kolašin	3,7	4,0	2,6	2,9	1,6	1,8
Mojkovac	1,6	1,4	1,9	1,6	1,6	1,6
Pljevlja	9,5	8,2	8,8	8,2	5,8	6,2
Plužine	2,1	1,9	1,7	1,7	0,7	0,7
Rožaje	2,9	2,1	3,0	2,2	3,7	2,8
Šavnik	2,0	2,0	1,3	1,3	0,5	0,5
In MNE (%)	23,4	21,0	20,5	19,1	14,6	14,4

Source: Author's calculations based on MONSTAT data.

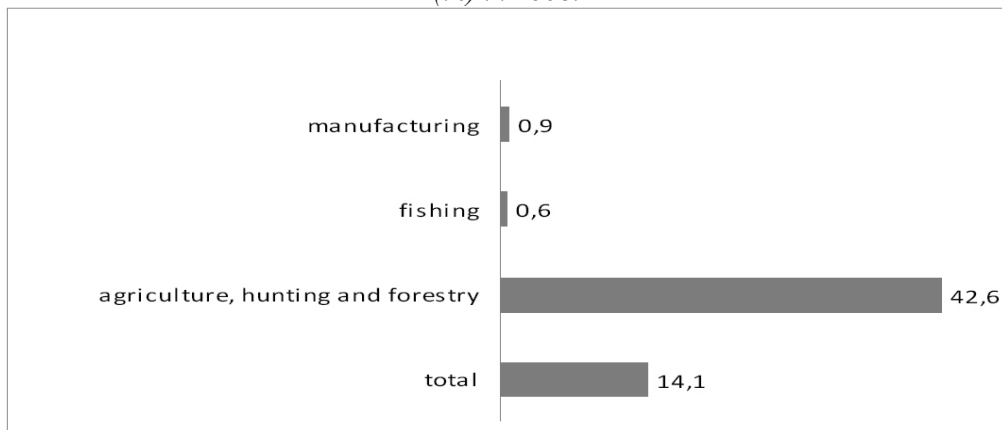
The largest share of mountainous regions in the total population by age was found in populations of more than 55 years (15.8%) and lowest in the category of 30-55, only 13.9% (2003). This indicator shows the pronounced migrations from this area, depopulation of villages and aspirations of the working age population to seek employment in other parts of Montenegro or outside of Montenegro (graph 1).

Graph 1. Participation of regions in total population by age (%) in 2008.



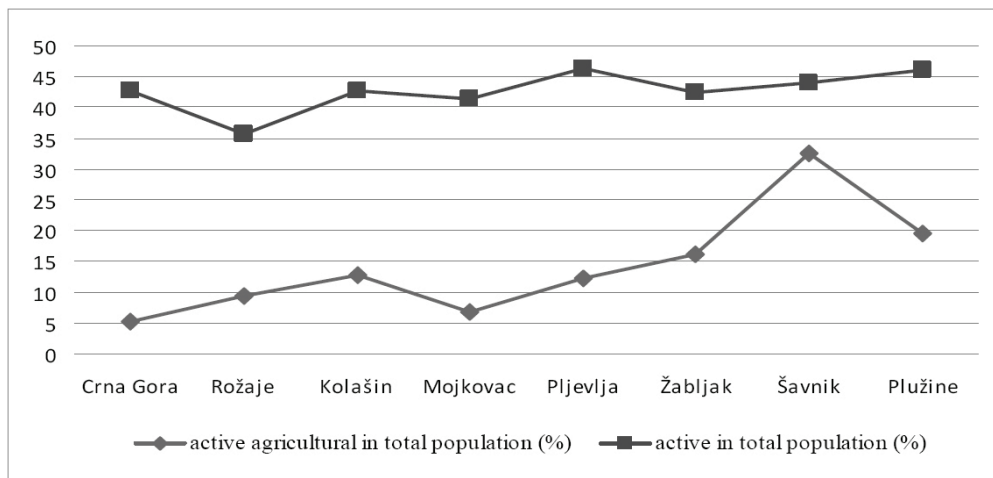
While the participation of the analyzed regions, the total active population, performing an occupation at the national level, is 14.1%, the share employed in agriculture, hunting and forestry is about 42.6%. On the state of manufacturing industry in this region, seen in terms of employees, it is best illustrated by the fact of its shares of only 0.9% of the total number of employees at the national level (graph 2).

Graph 2. Participation of region in total number of active population by occupation (%) in 2008.



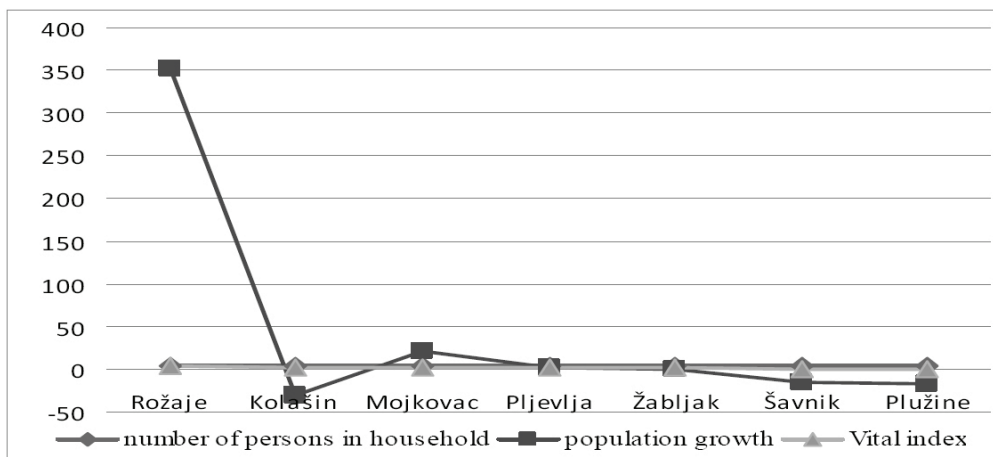
The economic structure of mountainous regions to a large extent conditioned by the participation of agricultural population in total, which was moving at the level of 8.0% in Mojkovac to over 30% in Šavnik (2003), well above the Montenegrin average of about 7% (graph 3).

Graph 3. Active agricultural and active population in total number of population (%) in 2003.



Except Rožaje and Mojkovac, where there was a positive population growth, in other municipalities are recorded negative trends that are manifested by a low vitality index (graph 4).

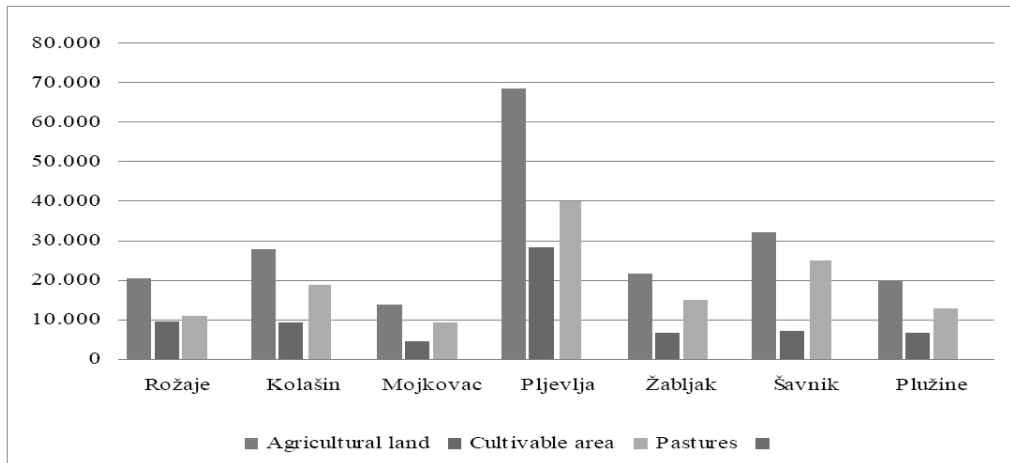
Graph 4. Basic indicators of development of the municipality in 2003.



3. Analysis of the situation of some branches of production

Viewed in terms of participation of agricultural land (39.4%) arable land (38%) and pasture (40.5%) of mountainous regions the total acreage at the national level to conclude that it is a region with significant potential land (2003). The most important agricultural and arable land are located on the territory of the municipality Pljevlja, while the smallest area in the municipality Mojkovac (graph 5).

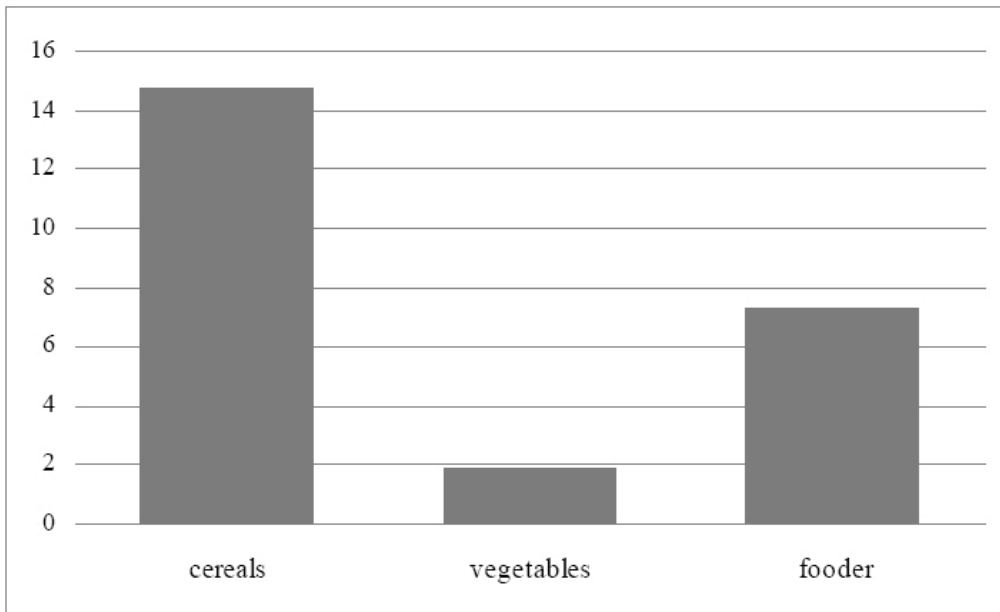
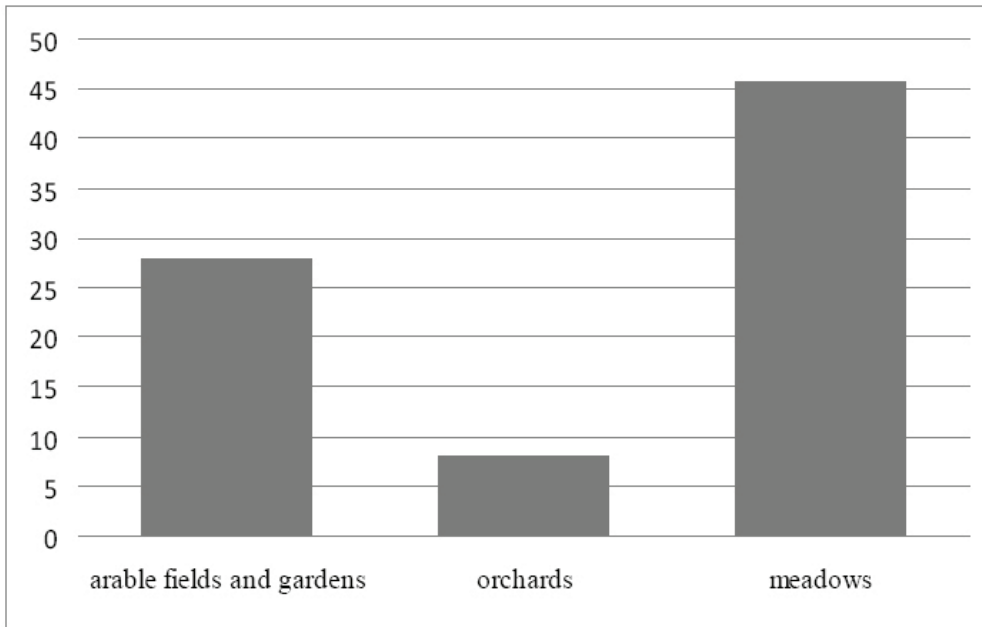
Graph 5. Agricultural land by categories of exploitation in 2003.



3.1. Crop Production

In contrast to the meadows, where the participation of regions in the total acreage is 45.7%, the share of arable land and the garden is relatively low and moving at about 28% (2008). The share of the total orchard area is Montenegrin, only 8.0%. The data on sown area under grain (14.7%), vegetables (1.9%) and cattle forage crops (7.3%) point to a low level of utilization of available land and lack of development of these manufacturing in this area (graph 6).

Graph 6. Participation of region in cultivable area (in %) in 2008.

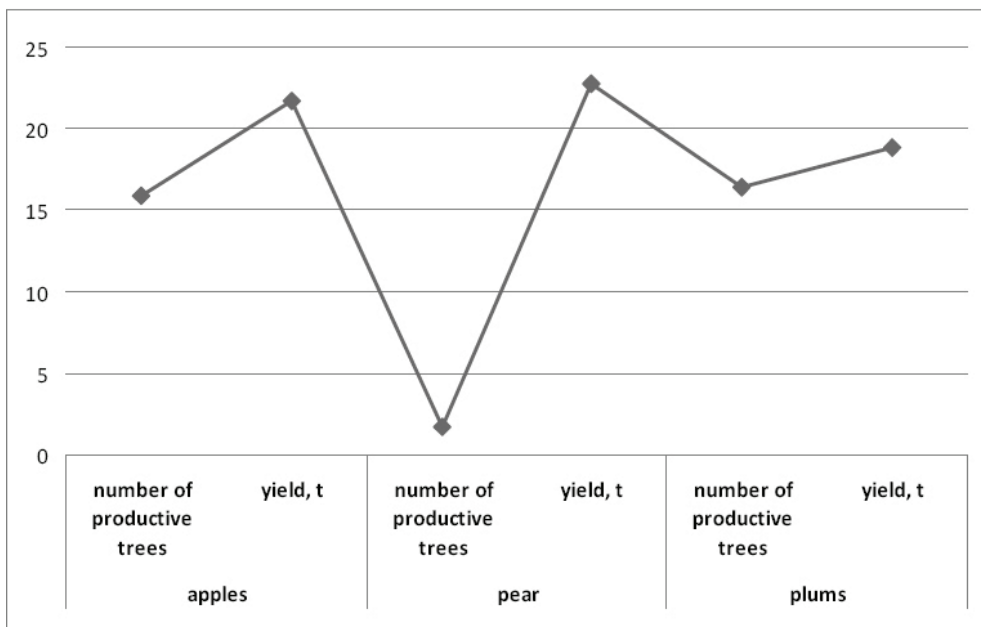
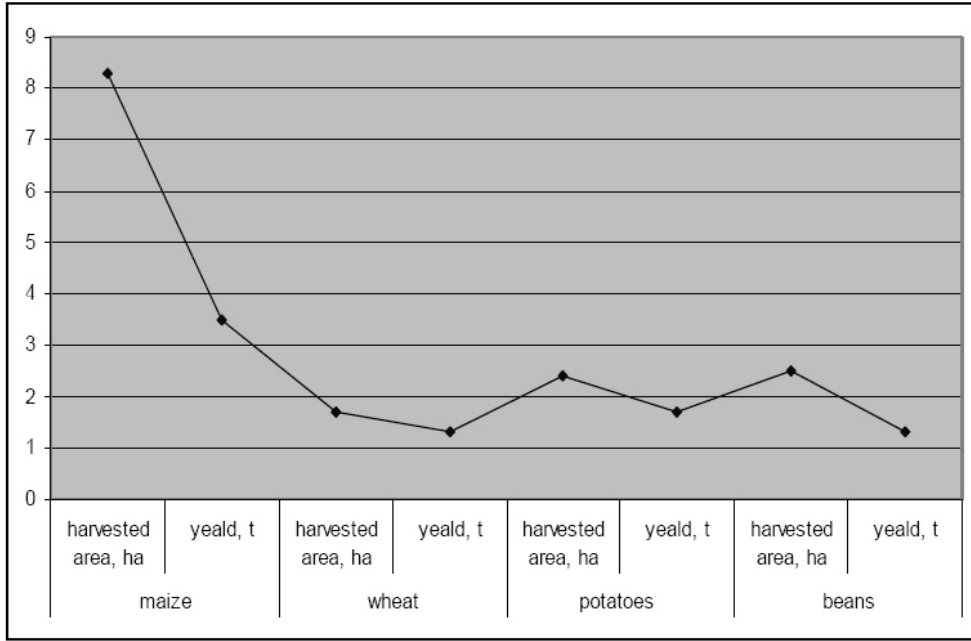


In this area, with relatively low share in total production of maize and wheat, while the share of potatoes and beans at the level of about 1/4 of the total Montenegrin production, thanks to production realizable in Kolasin and Pljevlja (2008). This resort participates in the yield of apple, pear and plum trees at the level of about 1/5 of total return on the level of Montenegro, with the gap between the participation in the number

of trees and yield (graph 7 and 8).

Graph 7. Participation of region in maize, wheat..(%) 2008.

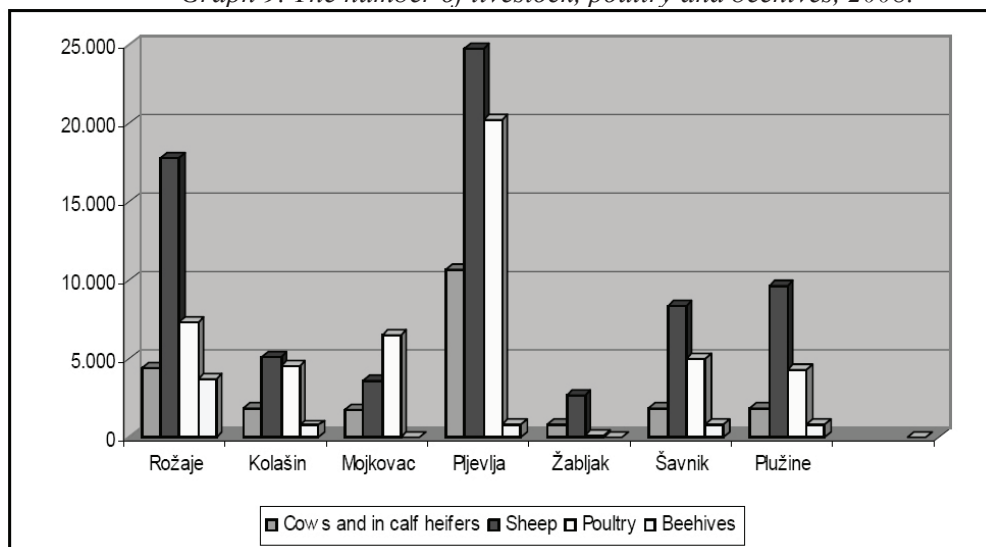
Graph 8. Participation of region in total number of trees and yield (%) 2008.



3.2. Livestock production

The population of the area of the zone has always been tied their existence, especially for agriculture, primarily ranching. Organized form of livestock production started to develop only after the Second World War. Although, significant production potential, land fragmentation and low level of intensity of production, competitiveness, productivity, unfavorable structure of farms in terms of number of heads, low education persons on the farm are just some of the characteristics of livestock production in this area. If we add to this and the relative unavailability of credit facilities, high production costs, variations in the quality and others to the promotion and development of the zone can not be expected in the short term. According to data from 2008 year in this area was around 37.4% of the total number of domestic cows and heifers, about 32.8% of pigs, sheep, 38.1% and 20.2% of poultry. Participation hives is 32.2% (graph 9).

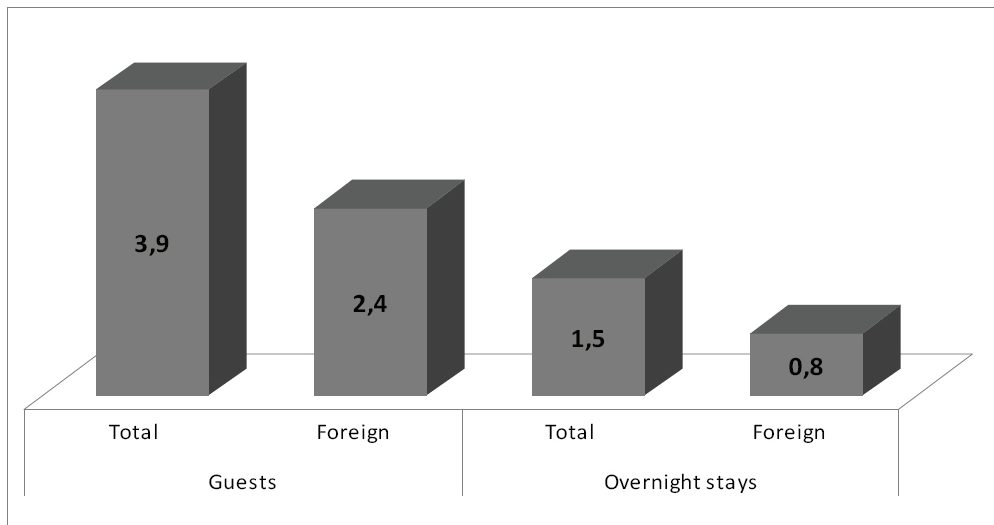
Graph 9. The number of livestock, poultry and beehives, 2008.



3. Tourists consumption

Achieved level of tourist spending, taken from the realized number of registered international guests and nights, and the available capacities, is an outstanding development opportunity for the entire area. Paradoxical situation that is exactly in this area one of the more serious problems for farmers, the problem of realization of the quantities produced, while on the other side of their implementation through tourist spending and output appears as the simplest way to export to the so-called doorstep "invisible export". Currently, the leaders in this area as the municipality of Žabljak and Kolašin, while other municipalities have a significant potential that are not sufficiently used in 2009. (Graph 10).

Graph 10. Participation of region in total number of guests and overnight stays (%) in 2009.



Instead of conclusion

The structure of agricultural production in mountainous region indicates the underutilized potential of the study area and the dominance of the primary, compared to the manufacturing industry, which continues to affect the low level of productivity, low competitiveness, and the relatively low share of marketability of certain agricultural products. Purchase of agricultural products is one of the major limiting factors for the development of the study area, in the past.

Actually, with the development of markets and market infrastructure will create the necessary preconditions for creating a higher level of accumulation of agricultural production which, together with higher quality credit support to banks and approving loans under favorable conditions, contributed, above all, a better realization of products from this region and to strengthen productivity and price competitiveness.

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Economics of agriculture

SI – 2

UDK: 633.8 (497.11)

CULTIVATION OF MEDICINAL HERBS AS SUCCESSFUL MODEL FOR DEVELOPMENT OF HILLY-MOUNTAINOUS REGIONS OF SERBIA

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Abstract

Thanks to the favourable climate, soil and unpolluted environment, Serbia is very suitable for intensive cultivation of medicinal herbs and has long tradition in this activity. Their production generates higher, faster and easier profit than any other agricultural crop. Relevance of issues relating to new resources of medicinal herbs imposes new obligations pertaining to finding of new possibilities of increased production of medicinal herbs in the World, in order to balance the relation between increasing demand for this valuable raw material and relatively limited supply on the market. Diversity of soil-climatic factors, as well as the production on various altitudes (even extremely high ones), are objective basis of successful plantation production of medicinal herbs in the Republic of Serbia. Despite the fact that cultivation of medicinal herbs is great investment since it generates several times greater income per hectare compared to corn or wheat, annually only between 1300 and 1800 ha of medicinal herbs are planted in Serbia. European market shows constant interest in high quality medicinal herbs originating from our territories, which would ensure to business operators in perspective significant financial results. Incentive measures of the Ministry of Agriculture, forestry and Water Management directed towards cultivation of medicinal herbs would significantly contribute to development of hilly-mountainous regions, as well as entire rural community of the Republic of Serbia (Ceranić, et al. 2005; Popović, 2008). Sustainable development of natural resources of medicinal and spice herbs is directly dependant on implementation and improvement of the legislation and standards which need to be harmonized with EU legislation and standards. Regardless of the great potentials of the herbal sector within the economical system of the country, many potential, especially in regard to export, higher stages of processing and cultivation of medicinal herbs (especially based on principles of organic production) have not been exploited.

Key words: *medicinal herbs, export-import, development of hilly-mountainous regions.*

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Introduction

Increase in interest for medicinal plants is a worldwide trend. In modern urban society, the accent is on industry, on technology of synthetic products, chemistry and on everything else that in uncontrolled conditions can be double-edged sword. It must be emphasized the importance of synthetic products, especially medicines, which have contributed to significant development of medicine. Modern medicine and pharmacology cannot be even imagined today without such a development. However, in the last couple of years, it is realized that, on the one side, the synthetic products are not omnipotent and that the use of these medicines is excessive, and on the other, the skill of treatment, which was developed for centuries and which became inseparable part of the cultural history of mankind, is neglected (*Kišgeci and Sekulović, 2000*).

Thanks to its geographical position, climate and soil, as well as a rich tradition, it can be said that Serbia is very suitable for collection and cultivation of medicinal, aromatic and spice plants. However, it can also be concluded that these potential opportunities are not used properly.

Sustainability of the sector of medicinal and spice herbs does not include only concern of the ability to renew natural populations, but rather a wide expending strategy which will ensure the position of the pickers as key, but marginalized social groups in the chain of trade and processing, and ensure implementation of standards and laws that have been harmonized with EU regulations. Domestic producers are mainly not present on the global market, they don't have stable production and supply, adequate equipment or necessary supporting document on the quality of product (*Ceranić, et al. 2005; Popović, 2008*).

Results and Discussion

Medicinal and aromatic plants are an important natural resource. Today, about 35.000 species of these plants are in use, both in official as well as in traditional medicine, and most of them have local significance. There are over 700 species of medicinal and aromatic plants in very rich and very diverse flora of our country, 420 of them are officially registered (11% of total flora) and 279 is in trade system (*Dajić and Dražić, 2003*).

Medicinal plants are very important commercial item, both in internal and in international trade. Trade circulation includes medicinal plants, either raw or dried, extracted medicinal ingredients as pharmaceutical raw material, but also as seed and planting material. Profitable production and export of medicinal plants and various extracts, pure compounds and essential oils, as well as completed (ready-made) remedies has commercial effects, but also represent a source of significant financial resources. Recently, demand for medicinal raw materials is growing rapidly, especially in the US, Canada and in the developed Western European countries. Serbia has a minor role in this type of activity in the European market, with only 0.43% of total imports

into the EU. The former enviably high level (in the period after the Second World War) of export of some medicinal plants (chamomile, sage) has drastically decreased. Extraordinary economic profit from the export of chamomile in former Yugoslavia, is now taken over by some neighboring countries. According to the Balkan Herbal Sector, Serbia was a major exporter of medicinal plants and their products. Namely, just twelve years ago, Serbia exported almost 40 thousand tons of medicinal plants and a large amount of essential oils. Now, this sector is quite neglected in Serbia, while in Bosnia and Croatia, it is developed, and former position of Serbia is now taken over by Bulgaria and Albania.

Thanks to favorable climate, soil and unpolluted environment, but also thanks to a long tradition, Serbia is very suitable for intensive cultivation of medicinal plants. Although the cultivation of medicinal plants is excellent investment – makes several times more income per hectare than corn or wheat – only between 1300 and 1900 hectares per year are planted in Serbia.

Table 1. Area under cultivated industrial crops in the R. of Serbia

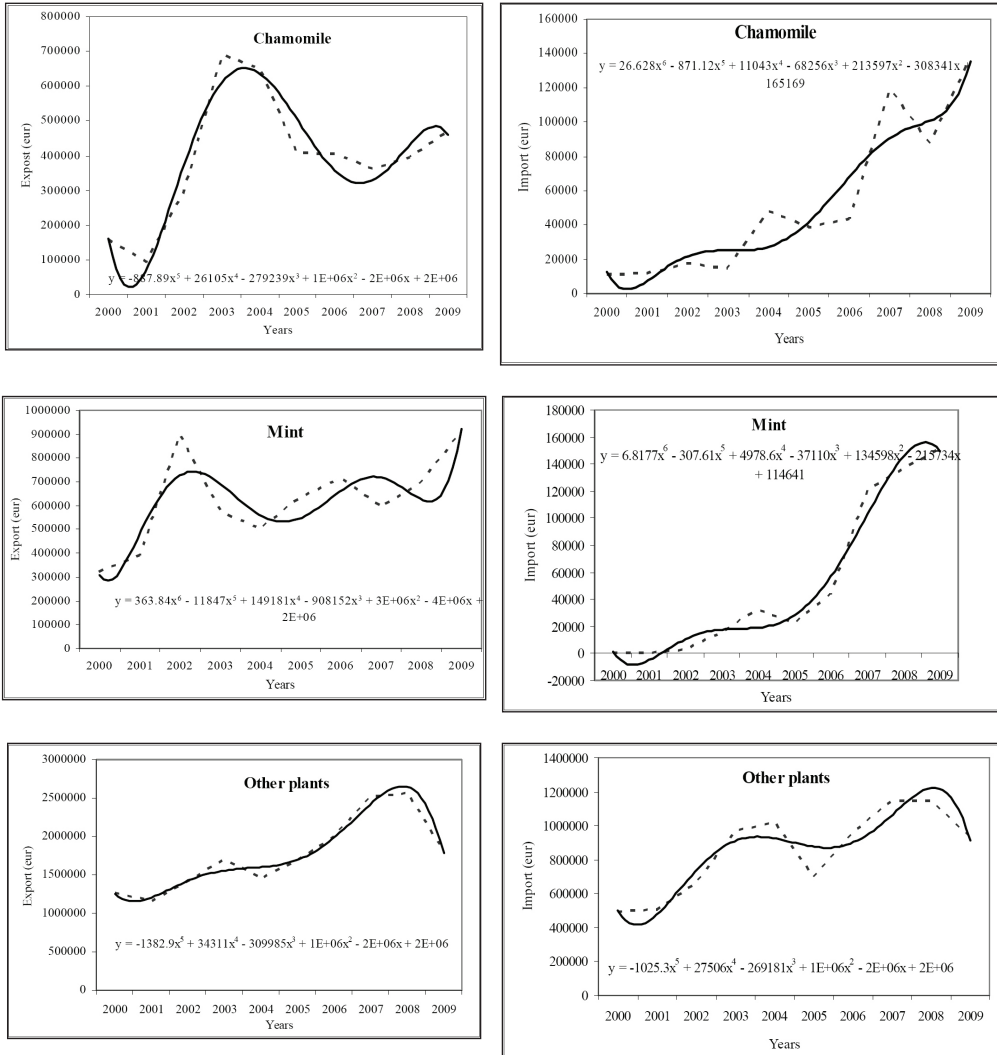
Year	Area (ha)	B_i (%) (2003=100)
2003	1740	100.00
2004	1684	96.78
2005	1621	93.16
2006	1211	69.60
2007	1289	74.08
2008	1436	82.53
2009	1674	96.21

Source: Republic Bureau of Statistics

Areas under cultivated industrial crops in the Republic of Serbia (Table 1) are extremely small and on very low level. Only 1.700 hectares are planted with medicinal plants. Compared to the year 2003, the areas under these crops have decreased at an annual rate of about 1%. Thanks to the favorable climate and unpolluted land, as well as a long folk tradition in the cultivation and use of medicinal herbs, there are favorable conditions for the development of this activity, especially in hilly-mountainous regions.

Production of medicinal plants has been accompanied by many problems: lack of organization, program separation, lack of equipment, as well as technical staff, irrelevance of science and practice, limited number of cultivated species, very low yield, quality that is dissatisfactory, under-developed market – resulting in decline in production and in export of medicinal plants. The most exported plants are: mint, chamomile, maelissa officinalis, marshmallow, parsley, fennel.

Graph. 1. Trends export and import of medicinal plants in Republic of Serbia



EXPORT

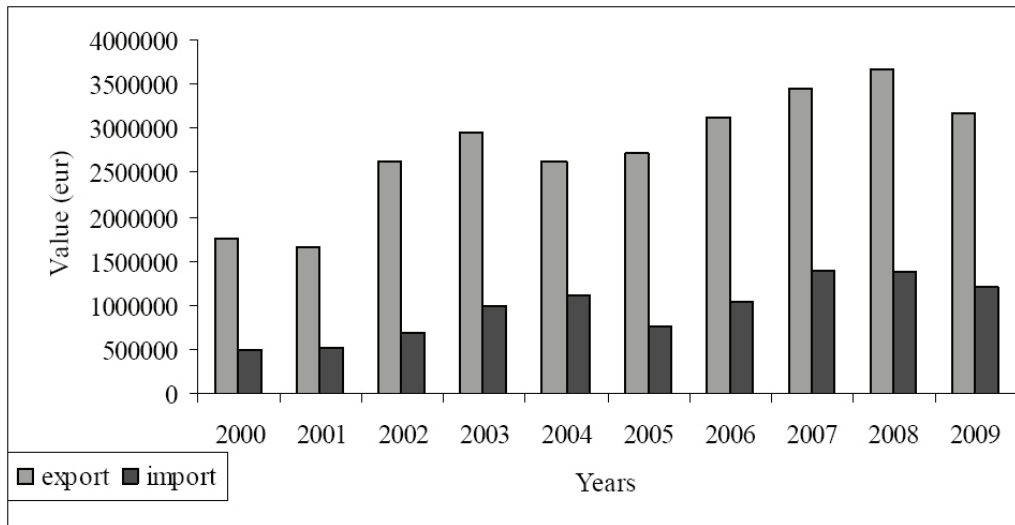
IMPORT

Serbia was one of the leading countries in the region in the export of medicinal plants, but now, there is not even ten percent of that former export. Currently, export of medicinal plants worth about 3.2 million euros. There are presently five large exporters in the country. Producers are limited by the law on control of plant exploitation which sets the quotas for certain specific plant species. This represents huge problem in export. Therefore, a group of producers has been founded in cooperation with USAID, in order to eliminate current confusion and legal barriers together with our Ministry of Agriculture, Forestry and Water Management. Also, serious problem derives from the EP 2010 (57) SI – 2 (100-107)

fact that producers receive no subsidies from the government, whereas in surrounding countries, people engaged in production of medicinal herbs have assistance and help from the government and therefore are more competitive on the market. So, growers and processors of medicinal herbs and teas rightfully expect from our Government equal treatment as other agricultural sectors, i.e. subsidies and incentives for production and export.

Significantly, higher share in the foreign trade of medicinal plants is refer to export and is nearly three times higher than import (Graph 2).

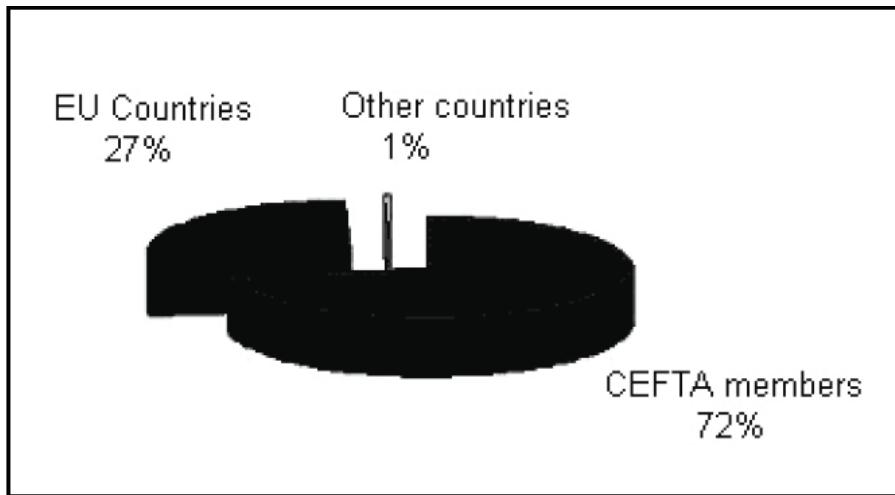
Graph. 2. Value export and import of medicinal plants in R. of Serbia



In the observed ten-year period, the export value of medicinal plants grew at an average annual rate of 6.8%. At the same time, the average export price increased for about 5% annually. This means that a high growth rate of export value is not only a consequence of increasing the export quantities, but also a consequence of increasing the export prices.

The target export market for Serbia is EU and CEFTA member countries. Great amounts are exported to Germany, but significant share in export belongs to the former Yugoslav republics: Bosnia and Herzegovina, Croatia, Macedonia and Montenegro (Graph 3).

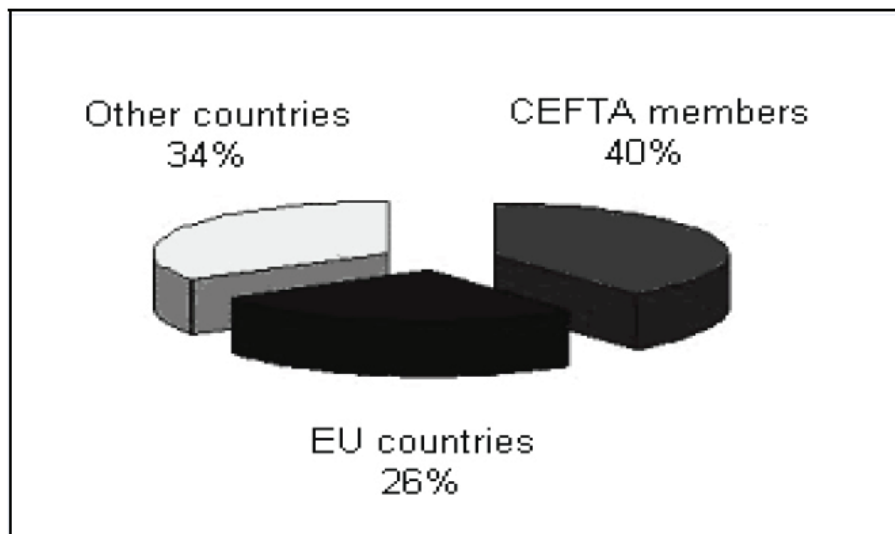
Graph. 3. The most important export markets of medicinal plants and teas



Source: Custom administration

At the same time, unevenness with an upward tendency can be noticed in trends of imported medicinal plants. In fact, in year 2009, both, the value and the quantity of import increased twice as compared with year 2000. The average annual growth rate of import was 10.22%. There is a significantly larger amount of imports of medicinal and aromatic plants in the last few years. The countries that are important for Serbia for import of medicinal plants are Croatia, Egypt, Austria and others (Graph. 4), and in the case of EU countries, that are Slovenia, the Netherlands and Germany.

Graph 4. Origin of imported medicinal plants



Source: Custom administration

According to the ongoing principles of organic agriculture throughout the world, production of medicinal and aromatic plants in our country, has its future especially in mountainous areas, which are on the one side completely ecologically acceptable for this type of activity, and on the other side, these are economically undeveloped areas with a large number of unemployed. Processing and growing medicinal plants is just a way to win foreign markets, but the main role should be given to small and medium-sized enterprises as carriers of development of this sector of the economy.

In order to support the production of herbs in hilly-mountainous regions, it is necessary to ensure adequate prerequisites which will stimulate the development of this sector of economy. First, it is necessary to provide institutional conditions through appropriate state institutions. Legislation is an important prerequisite because it should provide such conditions that will enable economic entity businesses to operate in a regulated and secure legal environment.

An important prerequisite for the development of this sector of the economy is ensuring sufficient funds, where both the state and the banks should have an unavoidable role.

Great importance is given to the effective program of quality system that will be available to all who are interested in a successful business.

Conclusions

Medicinal plants are part of tradition and culture in the Republic of Serbia. Thanks to favorable climate, soil and unpolluted environment, Serbia is very suitable for intensive cultivation of medicinal plants. Production of medicinal plants makes bigger, faster and easier profit than other agriculture production. The main role in the sustainable development of medicinal and aromatic plants sector certainly belongs to plantation way of growing plants that are significant, either in terms of nature conservation, either in terms of demand (thus reducing pressure on natural population). Growing medicinal plants, if organized in appropriate circumstances, can achieve optimal yield, in total plant mass, but also in quantities of medicinal substances. Therefore, this way of growing often has an advantage over traditional collection of plant materials in their habitats. That is primarily because of preserving endemic and endangered species from extinction, and because of the fact that this way of growing can ensure predictable, clean, acceptable and quality medicinal plants raw materials, which are indispensable for industrial production of medicines or cosmetics and chemical products. Plantation growing can produce species that are non-native to our region, and thereby can reduce the import of raw materials. Soil, climate and plant species selection and also, adequate growing technology, can provide raw materials that are better and uniform quality compared to the raw materials that are collected in nature. Therefore, hilly-mountainous region has a special place as habitat and location for organization of future production.

This branch of agriculture needs incentives in order to improve and increase the production, even though it realizes surplus. This activity, in spite of series of problems

in business operation, realizes annual trade surplus of over million US\$. Since 2009 begins the creation of Free Trading Zone between Serbia and EU countries. According to the Agreement on Stabilization and Association, our market of agricultural products will be gradually opened for import from EU over a period of six years. In regard to medicinal herbs and teas, the Agreement stipulates mutual abolition of customs tariffs on the day the Agreement on Stabilization and Associations comes to effect, which is huge incentive for future production and export of herbs.

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Economics of agriculture

SI – 2

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HARVESTING SPONTANEOUS VEGETATION OR PURCHASE MEDICINAL PLANTS FROM THE MARKET? – CASE STUDY

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Abstract

The paper analyses the efficiency of material resources supplying of an enterprise that processes medicinal herbs. The objectives of the research are to identify the most cost-effective alternative of supplying herbs, out of two possible sources: spontaneous vegetation, by initiating a campaign of collection, or purchase them from contractors.

Econometric models are developed for choosing the optimal solution, entering data from a business of processing medicinal herbs in a computer program. The results show that there is a quantity of material resources for which is more profitable to get it by initiating a campaign of collecting plants from spontaneous flora, after which, for any additional quantity, it becomes more efficient to be purchased from the market.

Key Words: *econometric models, medicinal herbs, spontaneous flora*

Introduction

In this paper we develop econometric models to underpin the decision of supplying medicinal herbs, models made based on actual data provided by an operator. The activity of the company is processing and trading medicinal plants and products made from them.

Enterprises wishing to supply medicinal herbs have to choose among their acquisition from intermediaries or directly from farmers and initiate a campaign of harvesting spontaneous vegetation. There are advantages and disadvantages in cases, but the most important, the managers must take into account in underpinning decisions,

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are those related to economic aspects.

The research tries to answer the question: Which is better option to supply the medicinal plants for their processing: harvesting vegetation or purchase them from the market?

Given the different ecological features of species of medicinal plants, a general answer can not be provided. But the answer can be identified using a concrete example of medicinal plant for which data are sufficient to draw conclusions and econometric shape. *Arhangelica Angelica* was chosen as a medicinal plant, which is found in the spontaneous flora, and which was cultivated, as well.

The relevance of the research results from the fact that any enterprise can use the results for underpinning decisions of providing material resources, by introducing specific data of a company.

Material And Method

The data used to develop the econometric model is provided by SC Naturalia Impex. The company conducted a campaign of collecting fresh plant, from spontaneous flora, *Angelica Arhangelica* variety of Bucegi Mountains – Cheile Pesterii area of Ialomitei Valley, at an altitude of 1660 m. This area is very good for growth and development of this variety of plants that are very demanding to air conditions. Since the plant needs high humidity, the area is favourable, with many irrigated valleys of springs, rivers and streams and hills are positioned away from direct sunlight because of their position and the existence of secular pine forest with tall trees. This is one of the few areas suitable for growth and development of plant species *Arhangelica Angelica*, this being very sensitive to environmental.

Table 1. Quantities of plants harvested from spontaneous flora and costs

NO. DAYS	TOTAL COST (MDL)	Herb Quantities (kg)	Quantity of roots (kg)
-0 -	-1 -	-2 -	-3 -
1	90	7	3
2	180	16	7
3	270	27	12
4	360	35	14
5	450	43	17
6	540	51	22
7	630	59	24.5
8	720	66	27
9	810	72	29
10	900	77	31
11	990	83	34
12	1080	88	36
13	1170	91	37
14	1260	93	37.5
15	1350	94	38

(Source: Data provided by SC Naturalia IMPEX SRL)

Harvesting campaign lasted 15 days and was supported by 2 people specialized in picking plants from spontaneous flora. They worked 8 hours / day, with breaks, so the actual time worked is 7 hours / day. A person receives 45 lei / day. Thus, for 2 people, the company registered costs of labour of 90 EUR / day. After 15 days of plant harvest campaign of spontaneous vegetation, results have been presented in Table 1.

The workers harvested both vegetative part (herba) and the root, because this is one of the few plants of which all components are used. The amounts collected are reported in fresh plant, weighed immediately after being harvested. The two components, herba and root, are analyzed separately because they have different prices to the market.

Thus, the National Institute of Research and Development for Potato and Sugar Beet (INCDCSZ) provided the amount of 150 kg of fresh plant (without root), with a sales price of 9.312 lei / kg (excluding VAT), to SC Naturalia Brasov Impex Ltd. to secure raw material *Arhangelica Angelica* plant for a year. The root is harvested, usually every four years when this species is replaced in another area. Price quotations for *Arhangelica angelica* root were about 16 lei / kg (excluding VAT), freshly harvested root.

For comparing the acquisition costs between plants purchased from the manufacturer and the harvested one of spontaneous vegetation, we do not consider their transportation, because in both cases the distances are almost identical.

Results And Discussions

To determine differences in the costs of plants purchased from the manufacturer and the harvested of spontaneous vegetation, we consider the resulting quantity of one plant components as constant and we see how to change the quantity of the other component, depending on the minimum cost of acquisition.

In other words, y_1 records the result of the quantity component of fresh plant (herba), and y_2 the quantitative component of fresh root. It results the following relationship:

$y_1, y_2 = f(x)$ Considering two cases:

1. $y_1 = \text{constant}$ $y_2 = f(x)$, 2. $y_2 = \text{constant}$ $y_1 = f(x)$

Following the introduction of computer data and their processing using Office Excel program, it results the data in columns 4 and 5 of Table 2.

In column 2 of the table are presented data reported by workers, correlated with minimum cost, till the 15th day of the campaign. To forecast, for the next 5 days, the quantity of plants collected from the spontaneous flora, an econometric model is developed, where the endogenous variable is the amount of fresh plant that has been reported by collectors and the exogenous variable is the minimum cost that can be paid by the company to purchase the plant collected (under the conditions considered).

Table 2. Quantities of plant from data processing and costs

NO. DAYS	TOTAL COST (MDL)	Herb Quantities (kg)	Quantity of roots (kg)	y 1 = f(x) y 2 = constant	y 2 = f(x) y 1 = constant
-0 -	-1 -	-2 -	-3 -	-4 -	-5 -
1	90	7	3	4.5	1.6
2	180	16	7	7.3	1.9
3	270	27	12	8.4	1.2
4	360	35	14	14.6	2.1
5	450	43	17	19.1	3.1
6	540	51	22	20.2	4.1
7	630	59	24.5	25.6	5.0
8	720	66	27	30.9	6.6
9	810	72	29	37.2	8.7
10	900	77	31	43.4	11.4
11	990	83	34	47.9	13.6
12	1080	88	36	54.1	16.3
13	1170	91	37	62.1	20.2
14	1260	93	37.5	70.9	24.6
15	1350	94	38	79.7	29.7
16	1440	97.2	39.0	87.6	33.4
17	1530	98.4	39.3	96.8	38.4
18	1620	98.9	39.4	106.3	43.7
19	1710	99.0	39.4	116.0	49.3
20	1800	99.0	39.4	125.6	54.9

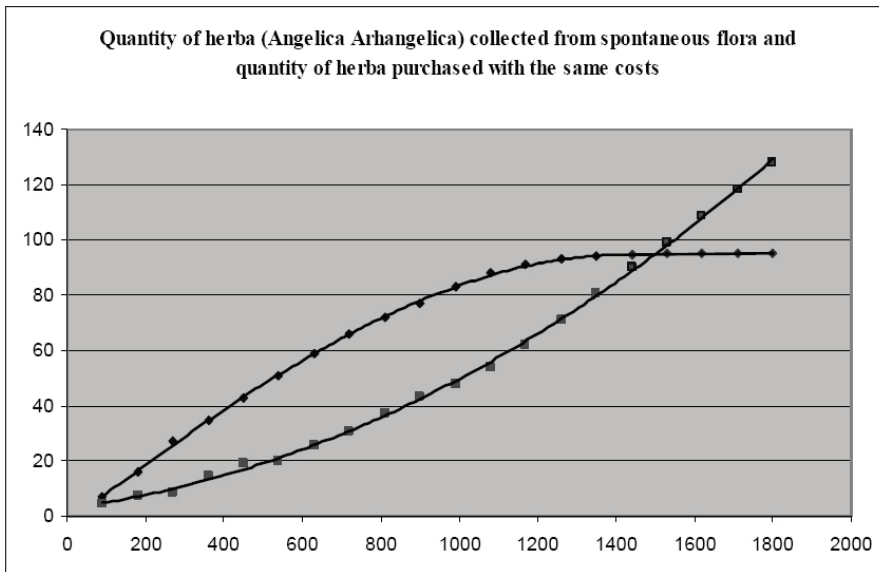
(Source: processing data provided by SC Naturalia IMPEX SRL)

$$f(x) = -3,8 * 10^{-5} * x^2 + 0,125653 * x - 4,90194, \quad y = f(x), \quad \text{if } f'(x) > 0$$

$$y = \max f(x), \quad \text{if } f'(x) \leq 0, \quad \text{or, in other words } \forall x \geq 1653, y = 9$$

In other words, the function will grow to the point of inflection (maximum), then it remains constant. Using the EViews program, it can be determined the correlation coefficient of variables, but also it can be tested the prediction model applied to data for the next 5 days, using the function above. Also, the function can be represented as shown in Figure 1.

Figure 1.



The economic interpretation of the chart above is that, regardless of plant varieties collected from spontaneous flora and regardless of where it is harvested, it results a function which has a limit the productive potential of the area. This is due to the limited feature of environmental resources which is specific to medicinal plants found in the spontaneous flora.

To enter a new upward slope, it is necessary that the team of pickers to move into a new area, where the campaign of harvesting the plant considered to continue. But the time for harvesting plants from spontaneous flora is limited and varies from one species to another, depending on a number of ecological factors. Thus, by the amount of quantity Y^*_1 , is profitable for a firm to initiate a campaign to collect herba *Angelica Arhangolica* of spontaneous vegetation. After this value, it is more profitable to buy fresh herb of the same species from the market. There is point of coordinates (X^*_1, Y^*_1) , which defines the threshold of profitability on the way a company should focus on buying fresh herbs (herba), in our case the point has the coordinates (1578, 98.7).

To check the significance of parameters and of function found for estimations expected, we used statistical tests and we developed them, only for explaining this model. Since the number of degrees of freedom is $T = 15 < 30$ we use the Student distribution with $T-k-1$ degrees of freedom, where k is the number of explanatory values. For a threshold of significance $\alpha=0,05$, in the distribution table Student is taken the value $t_{\alpha; T-k-1} = t_{0,05; 13} = 2.16$.

To check the significance of the correlation ratio, it is used Fisher-Snedecor:

$$F_c = \frac{T - k - 1}{k} \cdot \frac{R^2}{1 - R^2} = 8061.534$$

From the table of distribution Fisher - Snedecor, according to a threshold of significance $\alpha=5\%$ and number of degree of freedom $\nu_1=k=1$ and $\nu_2=T-k-1=13$, it is taken the value $F_{0,05;1;13;}=4.67$.

$$F_c=8061,534 > F_{0,05;1;13;}=4.67,$$

so the value of ratio correlation is significantly different from zero, with a significance threshold $\alpha=0.05$.

In column 3 of table 2 are presented data reported on the root of plant gathered by collectors, correlated with minimum cost, by the 15th day of the campaign. Doing the same as for results of quantities of herba collected, it is developed the econometric model to forecast the quantities of root harvested of spontaneous vegetation, in the following 5 days. The model will be represented as follows:

$$f(x) = -1,62 * 10^{-5} * x^2 + 0,0516 * x - 1,710989, \quad y = f(x), \quad \text{if } f'(x) > 0$$

$$y = \max f(x), \quad \text{if } f'(x) \leq 0, \quad \text{or, in other words, } \forall x \geq 1593, \quad y = 39,4$$

Without repeating calculation, results of Eviews program show that the function estimators are well chosen because the level of significance is almost 0. It results that the econometric model explains almost 100% the total variation of the phenomenon, with one exception – the coefficient $c(3)$, whose significance threshold is 0,0196.

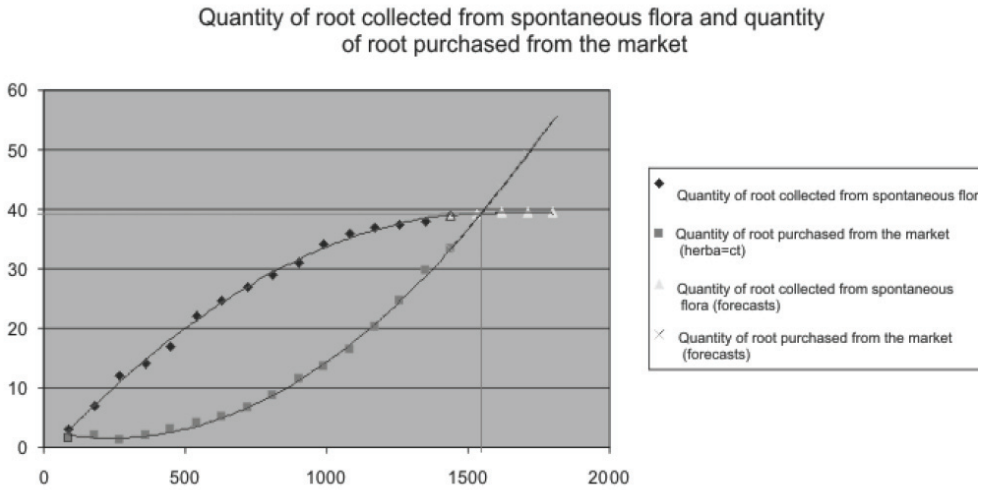
The data resulted after applying the model are presented in column three of Table 2.

In column 4 of table no. 2 is presented the quantity of fresh plant that could be purchased from the market, while taking account of the purchase of an equal quantity of root to the amount collected from the spontaneous flora. In other words, we identify the variation of the quantity of herba purchased from the market (with the same costs in the 2nd column) while it is purchased a quantity of root of *Arhangelica Angelica* equal to the amount collected from the spontaneous flora.

In column 5 of table no. 2 is presented the amount of fresh root that can be purchased from the market, while taking account of the purchase of an equal quantity of fresh plant to the amount collected from the spontaneous flora. In other words, we identify the variation of the quantity of root purchased from the market (with the same costs in the 2nd column), while it is purchased a quantity of herba *Angelica Arhangelica* equal to the amount of fresh plant collected from the spontaneous flora.

In Figure 2 are presented the two functions: the quantity of root purchased from the market and the amount of root collected from the spontaneous flora, reported the lowest costs.

Figure 2.



As in the case of herba, by the amount of quantity Y_2^* , it is profitable for a firm to initiate a campaign to collect *Arhangelica angelica* root of spontaneous vegetation; after this value is more profitable to buy the root from the market. There is point of coordinates (X_2^*, Y_2^*) which defines the threshold of profitability on the way a company should focus on buying fresh root, in our case the point with coordinates (1552, 39).

To start increasing again, it is necessary that the team of workers to go in another area, where to continue the campaign of harvesting the considered plant. But, the spontaneous flora has limited time of harvesting, which is different from one species to another, considering ecological factors.

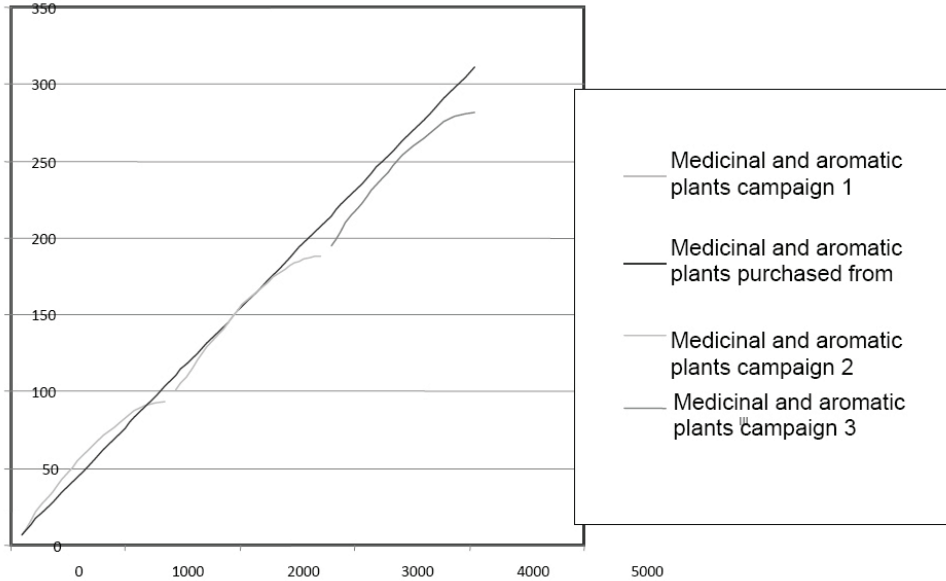
There are two ways of improving efficiency in harvesting medicinal herbs from spontaneous flora: increasing the number of workers and changing the areas of harvesting. In both cases the results are the same, but in the latter situation, the time may impose limits, because the initial number of workers might need for harvesting longer time than the time the plant may be harvested. In the first situation, space may be a problem, because, for rare species, this version is not efficient.

Analysing one of the two solutions, we suppose that the two workers continues the campaign in another place, with the same flora loading as the first area, and located closed to the first one (the costs with movement are almost 0). Then they go to the third area, identically with the second one. In reality, the following areas have less plant loading than the first, because the producer chooses the area with the highest load level from the very beginning. In addition, the yield of workers decreases.

The results of figure 3 show that the first campaign is more efficient than the following. If the campaign continues in areas as rich in plants as the first and the yield decreases, still the following campaigns are less efficient. In conclusion, the efficiency of harvesting medicinal herbs from spontaneous flora is directly proportional with

identifying and keeping the most rich and closed areas, and, indirectly proportional with the time needed to harvest medicinal plants from different areas (especially in the case of rare species).

Figure 3 – Efficiency of different plant collecting campaigns and plant purchasing



Conclusions

Decisions on underpinning the acquisition of material resources are grounded on economic principles. Taking into account the economic efficiency of the acquisition the plant *Angelica Arhangelica* by an enterprise of processing plants, there is a quantity of plant Y* till is more profitable to purchase it by initiating a campaign to gather plants from spontaneous flora, after which, for any additional quantity acquired, it becomes more efficient buying from the market.

Data may differ from one species to another. What is important is the scientific approach to determine the threshold of efficiency for purchasing these plants, and that wherever initiating these campaigns, there is a maximum quantity that can be collected from spontaneous vegetation (due to limited resources of nature) which is profitable for a business to start picking medicinal plants campaign, and after this amount, the company shall be guided in acquiring plants from the market.

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Economics of agriculture

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THE RISE OF PROFITABILITY IN SHEEP PRODUCTION BY OUT OF SEASON INDUCTION OF HEAT IN EWES

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Abstract

The paper presents the results for the sexual activity in ewes stimulated by progestagene substance fluorogestonacetate (FGA) in anoestral period. Synchronization was performed in late August and early May of 2009. The treatment was conducted in the ewes in the type of Sjenička improved sheep and total of 100 adult heads was treated. After 12 days, when the sponge was extracted from the ewes they received 1000 i.j. PMSG intramuscularly. The first mating was performed 48 hours after inserting PMSG, and the second one 72 hours after »service by hand«. It was asserted that the estrus was manifested in 98.00% ewes in the number of treated ones. An average fertility in ewes was 183.00%. Number of lambs per treated ewe was 1.83 and 1.93 lambs were obtained per lambing female. Number of sterile ewes was 3.00%. The trial showed that satisfying results have been obtained by using the sponge soaked in fluorogestonacetate (FGA) + PMSG in the conditions of natural mating with synchronization out of season in adult ewes in Sjenička improved type. The 63 lambs more were obtained in relation to regular seasonal mating and wider area of growing of mentioned genotype was asserted as well.

Key words: hormones, progestagens, fluorogestonacetate, ewes fertility.

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Introduction

Besides all planned and random actions performed in sheep improvement in Serbia, a pramenka sheep is still the most important sheep in a sheep breed structure, with Sjenička type as the most distinguished one. Sjenička type is important also for the size of its population and the area of its raising, as well as traditional and recognizable products obtained from sheep of this type (Sjenička sheep cheese, Sjenička lambs), *Mekić et al.*, 2008.

With the aim to improve the production of meat, milk and wool in Sjenička sheep its crossing with Merino sheep in the meat-wool type has been performed in order to obtain greater quantities of meat on one hand and to remove some shortcomings in regard to overgrowth and fineness of wool on the other. This has been conducted for a considerable time now, wherein Sjenička pramenka sheep is being crossed with Wirttemberg breed so that today Sjenička improved sheep is dominant on the terrain, *Mekić et al.*, 2008.

The production of lamb meat in Europe today represents the main task of sheep production because it brings the highest profit. In order to obtain greatest possible number of lambs per breeding female a number of methods for the control of estrus: hormonal and pheromone treatment, manipulation with photoperiod, etc have been used. Hormonal treatments are performed with: progestagens plus PMSG, prostaglandines, GnRH and melatonin. The treatments with progestagens plus PMSG have been most widely used in practice.

The objective of our paper was to scientifically establish the effect of progestagene substance Fluorogestonacetate (FGA) on sexual activity of adult sheep – Sjenička improved in anoestral period.

Material and method

The research into the effect of stimulative preparation fluorogestonacetate (FGA) on sexual activity of ewes in anoestral period was carried out on three individual sheep farms in the vicinity of Valjevo.

The trial included 100 heads of adult ewes in the type of Sjenička improved sheep. Inserting of intravaginal sponges was conducted in the period of April-May in 2009. The polyurethane sponges impregnated with 40 mg fluorogestonacetate (FGA) were inserted into ewes. After 12 days the sponges were taken out and at the same time to each animal was applied intramuscularly 1000 i.j. PMSG, of the commercial title «Sugonal». After the application of PMSG according to a prearranged schedule, the ewes were served two times in the following manner: the first serving was 48 hours after the moment of application of PMSG, and the second 72 hours after the same application. The serving was performed as a controlled «from hand» in individual boxes. During the trial all animals were in a good breeding condition.

Results and discussion

The effect of the action of stimulative progestagene substance Fluorogestonacetate (FGA) in anoestral period on ewes sexual activity is shown in Table 1.

Table 1.- Reproductive performances in ewes of Sjenička improved pramenka sheep treated with FGA in anoestral season

Ord. No.	Parametres	Indices
	Number of ewes treated	100
	In estrus in number of treated ewes	98
	Number of mated ewes	98
	Number of lambed ewes	95
	Number of sterile ewes in the number of ewes in estrus	3
	Total lambs born	183
6.1	Singles	24 (13,12%)
6.2.	Twins	126 (68,85%)
6.3.	Triples	33(18,03%)
	Fertility, %	183,00
	Number of lambs per treated ewe	1,83
	Number of lambs per lambed ewe	1,93

From the results displayed in Table 1 it can be concluded that the estrus was manifested in 98% ewes in relation to the number of treated ones.

As regards an average fertility of ewes which effects directly profitability of the production of lamb meat too, it was on average 183.00%. If we compare our results for ewes fertility in Sjenička improved sheep with the results of *Marjanović* (2001), where it was established that average fertility in mentioned genotype in seasonal mating was 119.24% on average we can see that in our trial the confirmed fertility was higher by 63.76%. This increase refers primarily to a greater number of twins, which was 68.85% in our trial in relation to total number of obtained lambs; there were 3.12% singles and 18.03% triples. Number of lambs per treated breeding female was 1.83 and per lambed ewe 1.93.

Our results are similar to the results of *Bešlin et al.* (1989), who asserted that after the use of Syncro-mate SŽK in the ewes belonging to Sjenička pramenka sheep 93.33% ewes in the number of treated ones were in oestrus, while with the use of Syncro-Mate Sugonal 96.66% ewes were in oestrus.

Skalicki et al. (1989) treated the ewes in Sjenička type by the method «Varamix» SŽK and asserted that estrus was manifested in 97.66% ewes, that there were 90.40% lambed ewes in the number of mated ewes while the number of live born lambs in 100 lambed ewes was 161.06%, what is lower in relation to our present trial.

Mekić et al. (2003) obtained better results by the use of FGA sponges in relation

to Medroxyprogesteronacetate (MAP). Number of lambled ewes in the number of treated ewes was 66% with the use of FGA, while with the use of Medroxyprogesteronacetate (MAP) it was 48.57%.

Ewes fertility is expressed by the number of obtained lambs per 100 lambled ewes and increases significantly by the increase in the number of twining, that is, bearing of greater number of lambs per ewe. In our research an average fertility of 183% was established, whilst the fertility in Sjenička improved ewe in wider area of raising in good growing conditions is about 120%. Therefore, the research showed that satisfying results have been obtained by the use of sponges soaked in Fluorogestonacetate (FGA) + PMSG in the conditions of natural mating at synchronization of estrus in the anoestral period in adult ewes of Sjenička improved population.

Conclusion

On the basis of the research conducted on the effect of induction and synchronization of oestrus in anoestrus period in ewes of Sjenička improved sheep using progestagene substance Fluorogestonacetate (FGA) + PMSG on reproductive parametres following conclusions can be made:

Number of treated ewes	100.
In oestrus in the number of treated ewes	98,00%.
Number of lambled in number of treated ewes	95,00%.
Number of sterile ewes in ewes in oestrus	3,00%.
Mean ewes fertility was	183,00%.
Per treated ewe it was obtained	1,83 lambs,
And per lambled ewe	1,93 lambs.

On the basis of the results obtained a general conclusion can be made that satisfying results were obtained with the use of FGA + PMSG in induction and synchronization of oestrus in out of mating season.

These investigations showed clearly that by the use of new biotechnological methods aimed to control reproductive capacities of ewes the shortening of sterile periods can be influenced upon, as well as the planning of the production of lambs for market when their price is higher, then increasing the number of lambs per one breeding female, what altogether effects the profitability and economy of sheep production.

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PARTICULARITIES OF GOLIJA NATURE PARK AND CONDITIONS FOR FURTHER DEVELOPMENT OF RURAL TOURISM¹

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Abstract

Nature Park „Golija“ is a mountainous area in Serbia with big the ecological and tourist potentials. The paper discusses the possibilities for development of rural tourism in the context of sustainable development and multifunctional agriculture, on the basis of present resources. Predisposition for the development of tourism is based next to the natural attractions and to develop local brands, which would be based on the improvement of livestock, dairy and meat production of autochthonous products for which there is a fair demand in the market. The standardization of the technological process of obtaining Golija cheese as a unique autochthonous dairy product is an activity that contributes to achieving the objective of improving the tourist offer Golija region.

Key words: *nature park, livestock breeding, rural tourism, sustainable development, Golija cheese*

Introduction

Golija is a mountain located in Dinara massif and represents a part of Starovlaska-Raska Mountain. The nature park Golija is located in south-west part of Serbia and outspreads at 75.183 ha on Golija Mountain and partly on mountains Radočelo and Čemerno; administratively, this area belongs to municipalities Ivanjica, Sjenica and Raška and to the towns Novi Pazar and Kraljevo. This area established as the nature park in July 2001, by Serbian government, while in the same year, within UNESCO program „Man and biosphere“, a part of this area (53.804 ha) was proclaimed as biosphere reserve, under the name „Golija-Studenica“.

Golija is characterized by the beauty of nature and according to many this the most beautiful and richest mountain forests in Republic of Serbia. Located about

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250 km from Belgrade and 39 km from Ivanjica is very attractive, but not enough popularized and used a tourist destination. The highest mountain is "Jankov kamen" 1833 m, due to good visibility and visibility from the slopes of this mountain some claim "to see it with half of Serbia".

In addition to the rich forest eco-system, there are high-quality pasture and meadow communities. Deciduous forests are mostly beech, it must be stressed, and the presence of relict species of mountain maple (*Acer heldreichii*). There are also represented mixed type forests; somewhere even of virgin forests nature. Evergreen juniper forests are especially amazing owing to some bog and lake ecosystems (Dajić lake and Košanin lakes). Beside relict Greek Maple is also significant an endemic of European Holly (*Ilex aquifolium*); except that, among other plant species (there are around 1100) there should mention those relict and endemic at the same time, like:

- *Allysum markgrafi*,
- *Allysum jancheni*,
- *Viola elegantula* i
- *Verbascum adamovicii*.

Local endemics are Serbian Spruce (*Paniccia serbica*) and adamovic's thyme (*Thymus adamovicii*).

In terms of animal species there are the following types of mammals: the wolf brown bear, fox, mole rat and the alpine shrewmouse. More than a hundred species of birds are present in the area. Some of the most represented species are: wild lark, wheatear, redshank etc.

Golija is a rich source of clean and healthy water (some are in use as sources of water that is bottled and is valued in the market). Streams from the wells form rivers rich with fish. On Golija are wells of Moravica (it springs on altitude of 1425 m and slopes down to 392 m of altitude) and Studenica (it springs on altitude of 1500 m and slopes down to 629 m of altitude).

From the point of climate view, summers here are cool, while winters are cold with snow that keeps for a long. There must be also stated the influence of Mediterranean climate in valley of Ibar, Studenica and Moravica, which lessen harsh continental climate, and makes this area more pleasant to stay in. Due to impermeable geological substratum and abundant rainfalls comes to creation of water accumulations and here are water resources very rich. The soil is suitable for forests and meadows, although can be grown cereals, potato and fruits.

As one of many preconditions for development of rural tourism is livestock breeding development. Golija can offer to potential tourists the high quality products, like Golija cheese, prosciutto, and Rakia that are among the organic products.

The condition of livestock breeding on Golija

At the level of Serbia livestock on the basis of statistical indicators in the nineties and the last ten years of the new century, showed a declining trend in relation to the size of the eighties. Such trend has reflected also on livestock breeding condition

on Golija, although this has represented a traditional activity of the population on Golija Mountain. In tables 1 and 2 are listed data on the number of cattle in Golija municipalities and cities, given the statistics on the overall level of municipalities and cities of 2006th and 2007th years. (Mijajlovic, et al. 2009)

Table 1.- The number of cattle and sheep in the investigated municipalities and cities for 2006.

	Count of cattle, state on 15. 01. 2006		Count of sheep		Count	
	Total	Cows and in-calf heifer	Total	Sheep for breeding	Cattle on 100 ha	Sheep on 100 ha
Sjenica	21.738	15.025	17.830	11.500	63	22
Ivanjica	14.335	7.992	28.940	23.441	39	56
Kraljevo	27.812	19.918	22.147	17.847	59	31
Novi Pazar	10.343	8.236	8.067	4.612	49	22
Raška	6.448	4.553	10.558	8.222	37	32

Source: Municipal Yearbook 2006th

It can be seen as indicators of the republican level, the trend to reduce the number of cattle or stagnation in the two observed at the level observed in all administrative areas, except in cases where Sjenica is recorded growth of sheep.

Good natural potentials, rich qualitative pastures, qualitative waters, preservation of these ecosystems make preconditions for organic plant and livestock production. But despite of all natural predispositions, it looked like the motivation and investments, necessary for livestock breeding development, have missed. In coordination with regulations which must be observed within the organic production, on Golija is possible to initiate and develop the organic production.

Table 2.- The number of cattle and sheep in the investigated municipalities and cities for 2007.

	Count of cattle, state on 15. 01. 2007.		Count of sheep		Count	
	Total	Cows and in-calf heifer	Total	Sheep for breeding	Cattle on 100 ha	Sheep on 100 ha
Sjenica	20.218	14.061	18.946	13.212	25	23
Ivanjica	11.420	6.625	24.319	19.149	22	47
Kraljevo	25.078	18.183	22.265	17.904	35	31
Novi Pazar	10.377	7.528	8.114	5.016	29	22
Raška	5.698	4.527	10.619	8.395	17	32

Source: Municipal Yearbook, 2007th.

The livestock breeding on the slopes of Golija has been mostly directed to satisfaction of local population needs. Purchasing and processing capacities for milk and meat are poor. Cattle breeding and sheep breeding are the most represented types of livestock breeding, although has started with breeding goats, too. On area of Ivanjica is small number of registered summer mountain pastures and two registered livestock breeding farms. Small number of private mini-farms is on that side which belongs to Raška municipality. In Sjenica settlement Vrujci/Duga Poljana is modern equipped ecological farm on area of 220 ha. Regarding that milk purchase, at the level of local shops and agricultural pharmacies, has been organized, the plans for enlargement and market-orientation of organic production of this farm have been directed to rural and ethno-tourism, according to management of this farm. The possibilities for standardization of technological procedure for making Golija cheese.

In regard to the standardization of technological procedure for making autochthonous Golija cheese, which could satisfy regulations of the Law on Safety Food, there was done some research on analyzing raw milk and cheese, which have been produced in individual households according to the traditional recipes (Vuković V., et al., 2010). There were made some analyses of raw milk from 6 Golija farms in accordance to the Rulebook on methods of chemical and physical milk and dairy products analyses (OG. SFRY No. 32/83); thus was noted that that 5 out of 6 collective samples were satisfying the parameters of milk fat and proteins percentage in relation to the reference values, regulated by the Rulebook on quality and other requirements for milk, dairy products, composite dairy products and starter cultures – Official Gazette SRY No. 26/02. From microbiological point of view, in accordance to the methods and norms, regulated by different rulebooks, the samples from all six farms have satisfied criteria, i.e. they have been microbiologically correct. In regard to pathogenic microorganisms existence, these samples were correct, but in sense of general hygienic correctness (which implies total number of microorganisms and number of somatic cells per 1 ml of sample), none of the samples were satisfactory. In regard to sensory evaluation of raw milk (colour, aroma, taste, general appearance and visible mechanical impurities), this raw milk is satisfactory.

In regard to the same parameters were analyzed also cheese samples after mentioned rulebooks in previous text. In regard to chemical parameters, analyzed cheese satisfies reference values, in microbiological sense were not find pathogenic microorganisms. Complete hygienic and sensory evaluation of cheese should be done in future researches. In initial phases of conditions review for standardization of technological procedure for Golija cheese production, by categorization, was determined that the cheese from Golija area was autochthonous cheese with maturation, white and soft, semi-fat cheese. It is necessary to undertake following activities in order to successfully perform the standardization.

Education of all that were included in cheese production (on terrain was noticed their interest to receive suggestions in this respect), Improvement of general hygienic conditions (passing from manual milking as more represented, to the mechanic milking – which requires enlargement of the flock).

Given the increasing interest of tourists in the local crafts and organic food production, would be necessary and education of the local population, which would milk and cheese producers to educate tourists to be found in an appropriate present to the production of traditional products of this regional brand “Golija cheese” made available in proposals of catering industry. In this way, in order to enrich the offer as a tourist and catering industry proposals and tourism product did different compared to other destinations in Serbia, which is the basis for obtaining competitive position in the market.

Perspectives of rural tourism

But points to the fact that Golija area designated as a separate state, and international status. Also, in this area related to more local administrative centers. This has hampered the application of integrated marketing at the tourist destination, and tourism, measurable results are below the objectively possible. The fundamental question in the future tourism development is : Will this division but with the standard political and economic problems at the state level (which is reflected in: the inadequacy of incentive measures, the price disparity, depopulation of rural population, increasing number of elderly persons in rural households, reducing the number of working-age population, fragmentation and other possessions.) complicate the plans and activities that are in the Spatial Plan Golija (2009) traced? Besides all the planned activities for improvement in this area must be viewed in the context of global economic crisis may also have a major impact on the realization of anticipated.

Spatial Plan Golija (2009), which includes the surface area of a broader nature park (93. 866 ha) is foreseen over the next ten years to create a tourist region, which along with a nature park existed and was of international and national importance. Naturally, the Tourist Organization of Serbia with the coordination of activities and the promotion of this area should play a crucial role for the future development of tourism. However, further investments are needed in both their quality and quantity. Based on planned accommodation facilities, tourist activities, natural resources, the attractiveness of the area, it is considered that the area met the Law of the Tourism and become integrated tourist region, which will facilitate the implementation of marketing and management of tourist destinations and also enhance tourism competitiveness.

The tourism development on the park Golija area is possible in many directions, regarding there are conditions for more tourist offers. The first line must be pointed out the high value of the cultural-historic bids that are monuments of great importance. In the first place to the medieval monasteries: Studenica, Brezova and Gradac, and Monastery Preobrazenje in Pridvorica and Monastery Svetih Arhangelata in the village Smiljevo, hamlet Kovilje. Studenica the monastery from the 13th century which is located in the valley of the river Studenica and which is due to their cultural, artistic, religious, historical and other characteristics protected by UNASCO. As monuments of great importance in the area are outstanding churches of Sts. Alexia in Milici, Sts. George's in Vrh, Sts. Bogorodice in Doce, Sts. Nikole in Palez, Gornja Isposnica in Savovo.

One of the objective constraints to further development of tourism is also the matter of roads (their quality) that would connect the area to tourists from major urban centres. Spatial Plan of the 2009th it was adopted at the level of the Republic of Serbia is planning to invest in the development of Golija in terms of building transportation infrastructure, which will provide faster arrival to the desired and planned resort in the park.

To increase the attractiveness of the plan is the construction of ski terrain and accommodation facilities for tourists in winter, which would use all the benefits that the mountain has to develop tourism based on winter sports. It should be noted here that snow keeps up to five months on some slopes (potential ski terrain). In addition to seasonal, winter and ski tourism, natural features are the basis for rural development and rural tourism in the summer. This would be complementary development of rural tourism, winter and increase the results of the tourism season and the visit would be greatly extended.

Some rural households engaged in rural tourism, even the seventies, as is case in the village Devici of Ivanjica. On the hill "Daici" at 1400 m above sea level are already well-known apartment Golija's gift. So in terms of rural tourism, there are some conditions, but it is necessary to extend the existing accommodation facilities and make additional investments in their quality to meet all the demanding needs of tourists. Special types of tourism are hunting and fishery, while the forests are full of various hunting game, and rivers and lakes with fish.

Hospitality as a feature of the local population whose actual catchphrase, „get our guests and friends leave“ is a prerequisite for tourism development. So far, tourists have shown interest in the visual presentation of the agrarian, village of seasonal work and/or gathering forest products- especially visitors from abroad. Of rural environmental units, which can be distinguished in terms of potential for development of rural tourism, say it is located in the municipality of Raska. It is the villages untouched nature and excellent conditions for rest and recreation. One particularly attractive is the village Brvenica that is located od the road towards Brvenik-Gradac, 5 km away from Brvenik. The existence of the river Brvenica in her rich fish stocks, especially high-quality trout that can catch what the attraction for tourists who enjoy fishing. Walk along the river can be particularly interesting because the existence of the mill, which today generally rare and which are still active. In addition walking can lead to meadows with rare plants. In Brvenica are house still look and accomplishment as the beginning of last century, which is a separate ethno-attraction of area. Also, the mountainous areas in the presence of local air currents provide the opportunity for the development of paragliding and other sports activities that would just complete stay in the area and influenced the development of tourism specific interests. With a healthy and tasty food, clean water and air, here are conducted walking tours to nearby villages and monasteries Gradac as a special cultural monument.

Conclusion

Nature Park Golija preserved nature of the Republic of Serbia. Provided measures of protection and improvement of this area should ensure availability of all the natural resources of the area to tourists, but also use them so they do not disturb the natural environment in accordance with the principles of sustainable development. Expansion and modernization of livestock production contributes to the improvement of production of milk and meat. In the process of standardization of indigenous Golija's cheese, which is an important part of rural tourism supply quality milk as starting materials must be preserved. This product, which is characteristic of the area Golija (its brand), may represent one of the backbone for the development of hospitality. Pristine nature offer great convenience to tourists, for the development of the winter, and summer tourism. This will enable the development of complementary extension of tourist season in the entire year, and potential income would be strong impulse in the development of this area. As potential forms of tourism that are for future development are distinguished:

Winter tourism,

Rural tourism,

Tourism of special interests (hunting, fishing, sightseeing, photo safari, tourism based on extreme sports - eg'. Paragliding, etc..

Bearing in mind the commitment of the Republic of Serbia to protect the area and declared a nature park, and development of existing documents, which emphasizes the tourist perspective of area, as one of the first step that the Tourist Organization of Serbia involved in the promotion and creation of tourist products of this area. This would clearly present resources (natural and social) are put in the tourist office and were conducted in accordance with adequate tourism principles. Multiplication of effects that tourism has on the overall economic and social life would be quickly felt, which would present negative socio-economic trend reduce and/or missing in time.

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SIMILARITIES AND DIFFERENCES BETWEEN LOWLAND AND MOUNTAIN REGIONS IN THE REPUBLIC OF SRPSKA

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Summary

Having taken the pre-war zoning in BiH as a starting point, in the Strategic Rural Development Plan of the Republic of Srpska its municipalities have been reclassified into the same regions. Based on the survey conducted in 802 rural households from 9 mountain and 3 lowland municipalities, analysis and comparison of the collected data between mountain and lowland regions have been done. The research has confirmed unequal development between rural households in mountain and lowland regions in reference to most of the considered characteristics. In comparison to lowland households, the ones in mountain regions dispose with more meadows and pastures, but fewer ploughed fields, have less capital equipment, generate lower income with non-agricultural activities making a major part. Moreover they are oriented towards livestock breeding, mountain villages have fewer communal infrastructure facilities and less access to health, education and other services. Due to all of these, additional effort should be invested in the future to reduce those differences by introducing special and differentiating already existing measures in order to direct them at faster and intensified development of mountain region.

Key words: mountain region, lowland region, unequal development.

Introduction

720 million people or 12% of world population lives in mountain regions (SARD, 2007). Mountain and non-mountain regions are neither even precisely defined at the world scale. In a WHO report (*Human Health Impact, 2005*) all regions with altitude

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higher than 300 meters are mountain regions, and could be said by analogy that more than 50% of the territory of the Republic of Srpska is mountainous area. No document has officially established a division of the RS territory defining it as mountain, lowland or other regions, not even the Spatial Plan of the RS (*Rokvic et al., 2009*). The Republic of Srpska has a heterogeneous topography with the lowest altitude of 80 and the highest altitude of 2,368 meters. Terrains below 500 m altitude amount to 48%, whereas terrains above 1,000 m amount to around 20% its area (*Prostorni plan RS, 2008*).

The division of BiH to six types of regions (lowland, hill, hill-mountain, mountain, mediterranean-mountain and mediterranean) that had been done prior to the last war (*Dugorocni program razvoja agrarne privrede u Bosni i Hercegovini, 1986*) has been taken as a starting point due to the lack of a more recent division. Therefore, establishing demographic, economic, social and other characteristics of mountain region and comparison to the same ones referring to the lowland region seemed interesting for research.

Apart from classification in terms of natural-geographic regions, it is necessary to determine and mark off less favourable areas for agricultural production in order to define development goals more precisely, as it was predicted by one of the measures in the Strategic Rural Development Plan of the RS (*Mirjanic et al., 2010*).

Research material and methods

For the needs of drafting The Strategic Rural Development Plan of the RS from 2009-2015 (*Strateski plan ruralnog razvoja Republike Srpske, 2009*), within a socio-economic analysis, 1,390 rural households from 21 municipalities have been interviewed. In accordance to the said division to 6 regions, stratification of data for 9 mountain municipalities (Gacko, Nevesinje, Foca, Rogatica, Han Pijesak, Sekovici, Knezevo, Sipovo and Ribnik) and 3 lowland municipalities (Bijeljina, Modrica and Gradiska) has been done for the needs of this survey. Out of the collected data for all rural households, data for 492 households from 9 mountain and 310 households from 3 lowland municipalities were selected (in total 802 households). They were grouped based on monitoring variations between mountain and lowland region as well as statistically and mathematically processed. Data were systematised following 19 characteristics and compared between mountain and lowland regions (showed in tables which are following). Main scientific-research methods that were used include interview, structure analysis, comparison, induction and deduction.

Results and discussion

The following groups of socio-economic characteristics of mountain and lowland rural households and farms in the Republic of Srpska have been researched and compared in terms of their:

1. Demographic structure,
2. Employment and income structure,
3. Property (capital) structure and
4. Rural population's access to services.

Questionnaire data have been systematised into five tables and explained after table delineation.

Demographic structure

The following demographic characteristics were the subject of the survey: type of rural household, number of household members, age structure, education level of household members. There are more agricultural households in the lowlands (1/2) than in mountain region (1/3). However, there is a high percentage of non-agricultural households in the rural lowlands (43.8%), meaning generate income is generated outside agriculture whereas there are only 10% of such households in the mountain region. Mixed households prevail in the mountain region (even 60%) while there are ten times fewer of these in the lowlands (6%). The structure of rural households according to number of their members is not significantly different between mountain and lowland regions although mountain households have 0.4 less members than the lowland ones (4.2 to 4.6). Rural mountain households are not older than the lowland ones since their age structure distribution is even. Mountain households are more educated than the lowland ones (they have higher percentage of high school graduates and university students), which can be explained by greater motivation to educate the children from these areas. This is further confirmed by data saying that a number of children from mountain region who moved to towns or abroad are two times higher in comparison to those from the lowlands.

Employment and income structure

The following economic characteristics of rural households were the subject of the survey: employment status of the rural households' members, the structure of the source of income, amount and structure of income generated through agriculture.

Table 1 - Employment status of the rural households' members in the mountain and lowland regions in the RS

	<i>Employment status</i>	<i>Mountain region</i>	<i>Lowland region</i>
1.	Full-time employment	15,38 %	12,61 %
2.	Part-time employment	2,25 %	0,63 %
3.	Private (their own) business	1,33 %	2,10 %
4.	Seasonal job	2,16 %	0,77 %
5.	Farmer	17,72 %	25,79 %
6.	Unemployed	10,84 %	10,09 %
7.	Pensioner	11,62 %	4,98 %
8.	Housewife	13,82 %	17,8 %
9.	Student	24,43 %	24,88 %
10.	Living abroad	0,46 %	0,35 %

Source: Survey of 802 rural households from 12 municipalities in the RS.

Every fourth member of a household in the lowlands refers to himself as a farmer whereas in the mountain region only 17% of them do so. There are more housewives and self-employed in the lowlands. There are twice as many pensioners in the mountain regions and also more full-time and part-time employed, seasonal jobs and those employed abroad. Both regions share the same number of the unemployed, pupils, and students.

Table 2 - The structure of the source of rural households' income in the mountain and lowland regions in the RS

	Type of income	Mountain region	Lowland region
1.	No income	1,63 %	0,65 %
2.	Selling their own agric. products	77,24 %	91,94 %
3.	Selling wood, stone and gravel	5,28 %	1,94 %
4.	Providing services using agric. mechaniz.	8,33 %	10,65 %
5.	Wages for doing agriculture-related work	8,94 %	0,97 %
6.	Leasing agricultural land	0,61 %	0,65 %
7.	Employment outside agriculture	43,70 %	39,68 %
8.	Private business (craft, trade, etc.)	10,37 %	10,97 %
9.	Tourism income	3,25 %	1,29 %
10.	Pension	41,67 %	18,71 %
11.	Social allowance	1,42 %	0,32 %
12.	Disability allowance	7,11 %	1,61 %
13.	Scholarship	1,42 %	0,32 %
14.	Assisted by relatives living abroad	2,64 %	1,29 %

Source: Survey of 802 rural households from 12 municipalities in the RS.

Property (capital) structure

The next task was to research scope and structure of the property that rural households that is farms dispose with and to determine whether there were substantial differences between mountain and lowland regions.

Table 3 - The structure of farm properties in the mountain and lowland regions in the RS

	Characteristic	Type	Mountain region		Lowland region	
			ha	%	ha	%
1.	Land owned by farmers	Arable land	1,17	20,3%	4,03	71,5%
		Orchards	0,26	4,5%	0,32	5,7%
		Vineyards	0,02	0,4%	0	-
		Meadows	2,42	42,1%	0,42	7,4%
		Pastures	1,17	20,3%	0,11	1,9%
		Fish ponds and wetl.	0,02	0,4%	0,01	0,2%
		Forests	0,69	12,0%	0,75	13,3%
	Total	5,75	100%	5,64	100%	

Source: Survey of 802 rural households from 12 municipalities in the RS.

Farms in the mountain region of the RS have slightly more land (for 0.1 ha) from the lowland ones but there are significant differences in its structure. Every second rural farm in the mountain region has a tractor whereas every lowland household has on an average 1.1 tractor. Regardless such difference, it could be said that mountain region farms are well equipped with drive machines but their average number of connecting tools per tractor is significantly lower (5.3 to 3.3).

In terms of facility availability for keeping particular livestock species, agricultural mechanisation and other agricultural production facilities, both mountain and lowland farms have similar facilities, having in mind that every mountain region farm has a stable whereas a small number of the lowland ones do not have stables at all. Mountain region farms have fewer facilities for storing maize, hay, mechanisation, and greenhouses, which is logical because of their production orientation and poorer mechanisations.

Mountain region in the RS is rather specialised for sheep and goat (there are very few goats) breeding and beekeeping, whereas rearing cattle has an important role both in the mountain and lowland region.

Table 4 - The number of livestock owned by farms in the mountain and lowland regions in the RS

	Characteristic	Type of livestock	Mountain region		Lowland region	
			Aver. no.	Piece/ha a.l.	Aver. no	Piece/ha a.l.
1.	Number of pieces of livestock	Cattle	3,7	0,55	4,36	0,55
		Pigs	5,4	1,08	16,94	3,46
		Sheep	15,2	2,25	4,99	0,63
		Goats	3,5	0,52	0,48	0,06
		Poultry	22,7	-	94,72	-
		Horses	0,4	0,05	0,06	0,01
		Bees (hive)	19,4	-	1,45	-

Source: Survey of 802 rural households from 12 municipalities in the RS.

Rural households in the mountain region in the RS on an average have more cherries, sour cherries, strawberries, raspberries, while those in the lowlands have more plums, apples, and pears. Number of trees per hectare that refer to previously declared fruit-growing land (orchards) suggests that fruit-growing is more extensive in the mountain than in the lowland region (around 265 of fruit trees per hectare against 826).

Access to rural services

Unequal development between the mountain region and the lowlands is often explained by unequal presence and access to public infrastructure, facilities and services that people who live there find necessary. Focusing on rural areas only, 20 facilities and 11 services, that rural population deems important for their life and work in these areas, have been researched.

Access to services that rural population in the mountain regions needs is not satisfactory. Every fourth village has a health facility, every third that is fourth (5 or 9 grades) has a school, and every fifth has a post office, collection point and playground. Every tenth village has a veterinary station, cultural centre and butcher's shop, whereas not even every tenth has a pharmacy, agricultural pharmacy, bank, kindergarten, electrical appliances' service or cattle market. The best situation is with shops that 59% of the villages have and restaurants/pubs that are present in every third village in the mountain region. However, even though there are quite a few shops, the closest one is on an average 3.7 km away while restaurants/pubs are 5.4 km away. All other services are even farther from rural households such as a school, from 5-7 km, or a health facility, 8-9 km. Rural communities' handicap in the mountain region in the Republic of Srpska is even more pronounced when it is compared with availability of services in the lowlands. Rural households in the lowlands have an advantage in everything, whether it is the existence of particular facility or its average distance from the beneficiary.

Comparing the situation in the mountain and lowland regions, rural households in the mountain region mainly lag behind when it comes to availability of basic infrastructural services.

Table 5 - Availability of particular services to rural population in the mountain and lowland regions in the RS

	<i>Characteristic</i>	<i>Type</i>	<i>Mountain region</i>	<i>Lowland region</i>
1.	Availability of the service in the village	Water supply	69,72%	39,35%
		Asphalt road	57,93%	79,35%
		Power supply	99,59%	99,68%
		Public transportation (bus)	57,52%	87,10%
		Landline	66,67%	96,77%
		Mobile phone	95,73%	99,03%
		TV signal (regular)	83,33%	98,39%
		TV signal (satellite)	10,57%	4,52%
		Sewage system	16,87%	2,90%
		Waste collection	14,43%	65,81%
		Street lights	13,82%	45,16%
2.	Availability of the service in the household	Electrical power	99,8%	99,03%
		Running water	80,28%	94,19%
		Phone	73,78%	95,81%

Source: Survey of 802 rural households from 12 municipalities in the RS.

Conclusion

The mountain region has more mixed and fewer agricultural and non-agricultural households. In terms of the number of members, households in the lowlands have more members. In regards with age structure of household members there is no significant difference between the two regions.

The mountain households are relatively poorer because even $\frac{2}{3}$ of them generate annual income that amounts to less than BAM 10,000. Agriculture plays lesser role in their income generation, whereas income generated through employment outside agriculture or pension is more important. In terms of income generated through agriculture, selling livestock and milk prevail.

The average land size is not even. In the mountain region, meadows and pastures (62%) dominate, whereas arable land makes most of the land in the lowlands (71%). On an average every lowland farm has a tractor while in the mountain region only every second. Mountain region farms keep more sheep, goats and bees, but fewer pigs and cattle. Mountain region farms grow three times less fruit.

In general, rural mountain population has fewer public facilities available in their villages that meet their needs in comparison to population in the lowlands including the greater average distance from all existing facilities in the mountain region.

Bearing in mind natural differences between mountain and lowland regions (relief, climate, biodiversity, etc) in the Republic of Srpska and by confirming the obvious inequality in development between rural households/farms through research, additional effort should be invested in the future to reduce these economic, social and communal differences by introducing special and differentiating already existing measures so they could lead to this goal and ensure higher financial funds to support development of mountain region.

First of all, need to carry out the identification and classifications of the less favorable areas for dealing with agriculture in the RS, in which will be classified the most of mountainous areas in RS. Mountainous areas should be given special legal privileges (for employment, taxation, lending, entrepreneurship development, etc), additional incentives (higher premium for products produced in mountain areas, specific subsidies and other fees for agricultural production and other activities in mountain areas), intensively invest in construction of rural infrastructure and improving access to public services in these areas. This can largely be achieved through implementation or the adopted the Republic of Srpska Strategic Rural Development Plan for the period 2009-15.

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DEVELOPMENT OF YOUNG GRAFTED WALNUT PLANTS IN NURSERY

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Summary

The effect of a loamy alluvial soil deposit on the survival and growth of young grafted walnut plants was evaluated. The study was conducted during 2003–2005, involving one cultivar and four selections: Šeinovo (control), Ovčar, G-286, Elit and G-139. The survival percentage for the cultivar and selections at the end of the first and second growing seasons was 77.3% and 74.3% respectively. The average vegetative growth of walnut nursery plants was 14.3 cm at the end of the first year and 171.6 cm at the end of the second. The highest survival percentage at the end of the first and second growing seasons was obtained in cv. Šeinovo (85.3% and 82.3%) and the lowest in G-139 (73.4% and 70.2% respectively). Vegetative growth at the end of the first and second growing seasons was highest in G-286 (15.0 cm) and cv. Šeinovo (177.6 cm), respectively, and lowest in Elit, being 13.6 cm at the end of the first season and 165.5 cm at the end of the second.

Key words: *walnut, loamy alluvial deposit, grafted plants, cultivar and selection*

Introduction

Soil plays an important role in the cultivation of high-quality walnut nursery plants. Stanković and Jovanović (1983) report that nursery soil must be sufficiently deep and moist, as opposed to compact, stony, dry, podzolic, too moist, saline, strongly alkaline or considerably acid soils which do not provide a suitable growing environment for walnut plants. Jelenković (1983) underlines the need to use light-textured, warm, porous, loose, irrigatable soil for walnut nurseries. Cold, compact, heavy soils containing high ground water levels are not suitable for walnut nursery plants production. According to Kremenović (1984), permeable loose soils having favourable thermal and air regimes and a pH of 6.5-7.6 are most favourable for walnut.

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The objective of the present study was to evaluate the effect of a loamy alluvial soil deposit in the nursery on the survival and growth of grafted walnut plants.

Material and method

The experiments were conducted at the Fruit Research Institute Čačak during 2003-2005. One cultivar and four selections of walnut were used, including Šeinovo (control), Ovčar, Elit, G-139 and G-286. Walnut grafts were planted during the second ten-day period of May. A total of 30 grafts per cultivar/selection were used. A randomised block design (5 cultivars x 4 replications) was employed, totalling 600 nursery plants.

The physical and chemical properties of the soil used in this study suggested that the soil was a loamy alluvial deposit.

At the end of the first and second growing seasons, the number of survived walnut nursery plants was determined. At 20-day intervals upon shoot emergence, plant height was measured from the graft union upwards by a metre scale.

The obtained results were subjected to the Fisher's model of analysis of variance - ANOVA (Fisher, 1953). The significance of differences between the means of the control cultivar and the other selections at $p \leq 0.01$ and $p \leq 0.05$ significance thresholds was determined using Dunnett's test (Dunnett, 1955). The significance of differences between particular seasons, and interaction means were tested using the LSD test at $p \leq 0.05$. The results are presented in tabular form.

Results and discussion

According to its morphology and origin, the soil used in the study was alluvium. According to its physical and chemical properties, the soil was classified as a loamy alluvial deposit. This type of soil was relatively light in texture (Table 1) and slightly acid in reaction. The 0-20 cm soil layer had a good supply of humus (2.76%), P_2O_5 (17.80 mg/100 g air-dry soil) and K_2O (28.25 mg/100 g air-dry soil) and a moderate supply of N (0.13%). Their content decreased with increasing soil depth. The 0-100 cm soil layer (Table 2) contained on average 58.2% total sand and 41.8% physical clay. The content of other fractions over the profile depth was within the following narrow range: coarse sand 1.0-3.0%, fine sand 54.0-58.6%, silt 20.9-26.2% and clay 17.0-18.8%. These values were not homogeneous due to the effect of floodwaters of the West Morava River.

Table 1. Agrochemical properties of nursery soil – Fruit Research Institute Čačak

Depth, cm	pH in KCl	K_2O mg/100 g, air-dry soil	P_2O_5 mg/100 g, air-dry soil	Humus, %	N, %
0-20	6.35	28.25	17.80	2.76	0.13
20-40	6.28	12.60	7.40	1.50	0.06
40-60	6.25	9.25	3.95	1.30	0.05
60-80	6.20	8.85	3.10	1.30	0.05
80-100	6.23	8.25	3.00	0.97	0.04

Table 2. Physical properties of nursery soil – Fruit Research Institute Čačak

Depth, cm	Coarse sand, %	Fine sand, %	Silt, %	Clay, %	Total sand, %	Total clay, %
0-20	3.0	58.1	20.9	18.0	61.1	38.9
20-40	2.0	54.0	25.6	18.4	56.0	44.0
40-60	1.0	58.3	22.3	18.4	59.3	40.7
60-80	1.0	58.6	23.4	17.0	59.6	40.4
80-100	1.0	54.0	26.2	18.8	55.0	45.0

At the end of the first growing season (Table 2), a highly significantly greater number of survived walnut nursery plants and a highly significantly lower number of unsurvived nursery plants were observed in cv. Šeinovo than in the other selections. As for years, 2004 gave a highly significantly higher survival percentage (82.4%) as compared to 2003 (72.3%) and highly significantly lower number of unsurvived nursery plants (17.6%) as compared to 2003 (27.7%).

The highest walnut nursery plants survival rate at the end of the first growing season was obtained by cv. Šeinovo (79.9% - 2003 and 90.7% - 2004), followed by the selections G-286 (73.4% - 2003 and 82.7% - 2004), Ovčar (70.2% - 2003 and 81.9% - 2004), Elit (69.3% - 2003 and 78.6% - 2004), and G-139 (68.9% - 2003 and 77.9% - 2004). The number of unsurvived walnut plants showed the opposite tendency. At the end of the second growing season, the number of walnut nursery plants survivals in control cv. Šeinovo (Table 4) was highly significantly larger than in the other selections, whereas no significant difference was observed in number of unsurvived nursery plants.

A highly significantly lower number of walnut nursery plants survivals (68.6%) was obtained in 2004 as compared to 2005 (80.0%). No difference was observed in the number of nursery plants non-survivals between 2004 and 2005.

Table 3. Walnut nursery plants survival at the end of the first growing season

	Cultivar/Year	Number of walnut nursery plants survivals at the end of the 1st growing season (%)	Number of walnut nursery plants non-survivals at the end of the 1st growing season (%)
Cultivar (A)	Ovčar	76.0±0.92 **	23.5±0.55 **
	Elit	73.9±0.68 **	26.1±0.55 **
	G-139	73.4 ±0.92 **	26.6±0.47 **
	G-286	78.0±0.64 **	22.0±0.62 **
	Šeinovo	85.3±0.58	14.7±0.51
Year (B)	2003	72.3±0.47 b	27.7±0.47 a
	2004	82.4±0.43 a	17.6±0.42 b
ANOVA			
Cultivar (A)		**	**
Year (B)		**	**
A x B		**	**

- A and B represent cultivars and years, respectively.
- Asterisks in vertical columns represent significant differences between the means at $p \leq 0.05$ and $p \leq 0.01$ according to Dunnett's test and ANOVA (F-test) results; ns- non-significant
- The values designated with same small letters within columns for years and interaction means do not differ significantly at $p \leq 0.05$ according to Lsd test.

Walnut nursery plants survival at the end of the second growing season was highest in cv. Šeinovo (76.8% - 2004 and 87.8% - 2005), followed by the selections G-286 (70.0% - 2004 and 79.8% - 2005) and Ovčar (66.4% - 2004 and 78.7% - 2005), and lowest in Elit (66.2% - 2004 and 76.6% - 2005) and G-139 (63.4% - 2004 and 77.0% - 2005).

At the end of the first and second growing seasons (Table 5), cv. Šeinovo showed highly significantly greater plant growth as compared to Elit and G-139, whereas no significant difference was observed between cv. Šeinovo and the selections Ovčar and G-286.

At the end of the first growing season in 2003, the walnut plants exhibited highly significantly lower growth (12.5 cm) as compared to 2004 (16.2 cm). At the end of the second growing season in 2005, growth was found to be highly significantly lower (159.9 cm) than in 2004 (183.4 cm).

Walnut nursery plants growth at the end of the first growing season in 2003 was 12.9 cm in cv. Šeinovo, 12.5 cm in Ovčar, 11.9 cm in Elit, 11.6 cm in G-139 and 13.4 cm in G-286. In 2004, the growth was higher and ranged from 16.3 cm in cv. Šeinovo, 16.5 cm in Ovčar, 15.3 cm in Elit, 16.1 cm in G-139 to 16.7 cm in G-286. At the end of the second growing season during 2004, plant height of walnuts was as follows: Šeinovo – 186.1 cm, Ovčar - 186.6 cm, Elit – 178.9 cm, G-139 – 176.3 cm and G-286 – 189.1 cm. Plant height in 2005 was 169.1 cm in cv. Šeinovo, 162.4 cm in Ovčar, 152.1 cm in Elit, 157.1 cm in G-139 and 158.6 cm in G-286.

Table 4. Number of walnut nursery plants produced at the end of the second growing season

	Cultivar / Year	Number of walnut nursery plants survivals (%)	Number of walnut nursery plants non-survivals (%)
Cultivar(A)	Ovčar	72.5±0.99**	3.50±0.20ns
	Elit	71.4±0.81**	2.50±0.26ns
	G-139	70.2±1.02**	3.20±0.20ns
	G-286	74.9±0.96**	3.10±0.26ns
	Šeinovo	82.3±0.78	3.00±0.24
Year (B)	2004	68.6±0.54 b	3.70±0.17 a
	2005	80.0±0.59 a	2.42±0.13 a
ANOVA			
Cultivar (A)		**	ns
Year (B)		**	ns
A x B		**	ns

- A and B represent cultivars and years, respectively.
- Asterisks in vertical columns represent significant differences between the means at $p \leq 0.05$ and $p \leq 0.01$ according to Dunnett test and ANOVA (F-test) results; ns- non-significant
- The values designated with same small letters within columns for years and interaction means do not differ significantly at $p \leq 0.05$ according to Lsd test.

A comparison of the physical and chemical properties of the soil used in this experiment with the results obtained by other authors suggests that the soil type concerned is suitable for walnut plants cultivation. Korać (1987) reports that the most favourable soils are those containing 3% humus, 250-300 ppm K_2O , 80-100 ppm P_2O_5 and pH 7-7.5. Solar and Stampar (2004) determined the following soil content to be suitable for walnut production: 2-3% humus, 8-10 mg P_2O_5 per 100 g air-dry soil, 25-30 mg K_2O per 100 g air-dry soil and pH 6.6-7.5. Šapa (2002) recommends soils containing 2.5-3% humus, 250-300 ppm K_2O and 100-120 ppm P_2O_5 .

Given the lack of specified data on walnut nursery plants cultivation on a particular soil type, the results obtained in this study do not completely comply with those of other authors. Plant survival percentage in cv. Šeinovo was higher as compared to the results obtained by Bugarčić and Mitrović (1985), who reported the survival rate of 53.3 % and 48.3 % in cv. Šeinovo at the end of the first and second growing seasons, respectively. Elit exhibited higher survival at the end of the second growing season as compared to the survival rate of 64.0 % produced by Solar et al. (2001). The total number of nursery plants produced at the end of the second growing season was also higher as compared to the reports of 50.0 % - 60.0% obtained by Bugarčić and Mitrović (1985). According to Korać (1987), a realistic expectation is to produce 40.0-50.0% seedlings at the end of the second growing season.

Table 5. Vegetative growth of walnut nursery plants

	Cultivar/Year	Vegetive growth of walnut nursery plants at the end of the 1st growing season	Vegetive growth of walnut nursery plants at the end of the 2nd growing season
Cultivar (A)	Ovčar	14.5±0.69 ns	174.5±6.72 ns
	Elit	13.6±0.66 **	165.5±6.82 **
	G-139	13.8±0.75 **	166.7±5.58 **
	G-286	15.0±0.80 ns	173.8±8.52 ns
	Šeinovo	14.6±0.60	177.6±8.86
Year (B)	2003	12.5±0.39 b	
	2004	16.2±0.25 a	183.4±5.09 a
	2005		159.9±2.29 b
ANOVA			
Cultivar (A)		**	**
Year (B)		**	**
A x B		*	**

- A and B represent cultivars and years, respectively.
- Asterisks in vertical columns represent significant differences between the means at $p \leq 0.05$ and $p \leq 0.01$ according to Dunnett test and ANOVA (F-test) results; ns- non-significant
- The values designated with same small letters within columns for years and interaction means do not differ significantly at $p \leq 0.05$ according to Lsd test.

An analysis of the vegetative growth of nursery plants suggests that growth of cv. Šeinovo at the end of the first growing season was lower as compared to that of 21.6 cm obtained by Bugarčić and Mitrović (1985). However, at the end of the second growing season, cv. Šeinovo exhibited significantly higher growth as compared to the 168.4 cm produced by the said authors. Korać (1978) reported lower plant height in cv. Šeinovo in the first (13.29cm) and second (160.18 cm) growing seasons as compared to the results of the present study. Korać (1987) reported the average plant height of 10-25 cm and about 150 cm at the end of the first and second growing seasons, respectively. Stanisavljević and Mitrović (1997) obtained higher plant growth at the end of the first growing season, whereas the growth at the end of the second growing season was similar to the present results. Walnut plants height at the end of the first growing season was 23.4 cm in cv. Šeinovo, 24.1 cm in Ovčar, 11.2 cm in Elit, 17.6 cm in G-286 and 21.4 cm in G-139. Plant growth during the second growing season was reported to range from 187 cm - Ovčar, 185 cm - Šeinovo, 172 cm - G-286, 167 cm – G-139 to 152 cm - Elit. Elit produced higher growth in the second growing season as compared to the 120 cm obtained by Solar et al. (2001). In Romania, Achim and Botu (2001) reported nursery plants growth of 168-172 cm, in Hungary, Suvages (1990) of 150-250 cm and in Turkey, Ozkan et al. (2001) obtained 179.7-244.5 cm high nursery plants among different cultivars.

Conclusion

A walnut grafted plant has a good vegetative growth with very good lignification and a well developed root system in loamy alluvial soil.

The survival percentage of the cultivar and selections tested in this study was 77.3% at the end of the first growing season and 74.3% at the end of the second season.

The average vegetative growth of walnut nursery plants at the end of the first and second growing seasons was 14.3 cm and 171.6 cm respectively.

Walnut plants survival at the end of the first and second growing seasons was highest in cv. Šeinovo (85.3% and 82.3%) and lowest in G-139 (73.4% and 70.2% respectively).

Vegetative growth was highest in G-286 (15.0 cm) at the end of the first growing season and in cv. Šeinovo (177.6 cm) at the end of the second growing season. The lowest vegetative growth at the end of the first (13.6 cm) and the second growing seasons (165.5 cm) was observed in Elit.

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MEDICINAL PLANT IN ANIMAL FEED

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Abstract

The medicinal plants and herbs have been used for many years in the treatment of various diseases in animals and human beings. Now-a-days, utilization of these medicinal plants is increasing. These are used in animal feed as the growth promoters. Due to prohibition of most of the antimicrobial growth promoters in animal feed because of their residual effects, plant extracts are becoming more popular. They act as antibacterial, antioxidant, anticarcinogenic, antifungal, analgesic, insecticidal, anticoccidial and growth promoters. These plant extracts compete with the synthetic drugs. Majority of medicinal plants do not have the residual effects.

The paper gives a short overview of the most important potential of herbal medicinal materials that have an approved application in human medicine and which can be added to animal feed for use in different animal health disorders.

Key words: Medicinal plant, animal feed, antibacterial, growth promoters.

Introduction

Animal feed has a direct impact on the quality of meat, milk and eggs in a positive and negative sense. Sustainable development is a strategy and principles of sustainable development to be applied to all areas of life and work and even the food for the animals. Over the composition of a meal for animals can manipulate the quality of products of

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animal origin and can be achieved by a variety of nutritional, sensory, chemical, physical and physiological characteristics. Also, through animal feed, various contaminants can be transferred to products of animal origin, ie. to food for people. More and more are ongoing and necessary research and determine the impact of animal feed on the quality of products of animal origin and monitoring the quality of these products depending on the composition of meals consumed by animals (Lević J. et al. 2009).

Improving technologies for sustainable production of animal feed should include different factors. The usage medicines in intensive and extensive farming is a big and risky to the quality of food and thus health. In organic farming of animals is not allowed to use medicines. Because are increasingly looking for natural healing means (Kostadinović Lj. et al. 2010). Medicinal herb provides, in the production of food for animals, a real opportunity to increase value through the use of different functional additions. Plants medicinal ingredients are different chemical nature and show a very wide range of pharmacological effects (sedative, spasmolytic, antibacterial activity, astringent, antiinflammatory, digestion-stimulating, laxative, antidiarrhoeal, choleric, to "stimulate the flow of milk" et al.), so that almost no therapeutics areas where medicinal plants can not be used in prophylaxis or treatment of both human and veterinary medicine (Runjaić-Antić and Milinković D. 1990, Thomson at Montvale 2004, Wichtl M. 2002).

Plants are the oldest friends of mankind. They not only provide food and shelter but also serve humanity by preventing and curing different ailments. Herbs and spices have always been helpful to cure diseases. In modern animal feeding, they are forgotten because of use of antimicrobial growth promoters (AGP). But due to the prohibition of most of AGP, plant extracts have gained interest in animal feed strategies (Charis, 2000). The risk of the presence of antibiotic residues in milk and meat and their harmful effects on human health have led to their prohibition for use in animal feed in the European Union (Cardozo et al., 2004).

The practice of herbal medicine dates back to the very earliest period of known human history. There is evidence of herbs having been used in the treatment of diseases and for revitalising body system in almost all ancient civilizations, the Egyptian, the Chinese and even Greek and Roman civilizations (Aftab and Sial, 1999). Kar et al. (2004) have reported that several plant products are claimed and proved to possess analgesic and antipyretic properties. Majority of herbal plants are safe and economical. Generally, plant extracts have no problem of drug resistance.

In developed countries in Europe is very strong trend of replacing synthetic antibiotic drugs based on medicinal plants (Čabarkapa I. et al., 2009). As herbal feed additives may be used drug (finely divided dry medicinal herbal raw materials), herbal extracts or herbal isolate (eg essential oil). Quality plant materials to ensure compliance with all required standards and legislation (good agricultural practice, good collected practice). Quality Score medicinal herbal raw materials is done by determining the content of active substances and testing health safety.

Medicinal plants, herbal medical products, phytopreparations or phytopharmaca, are medicinal products which contain only herbal drugs as active components or herbal

drugs preparations. Herbal drug is a whole or cut up, dry (occasionally raw) part of a plant, algae, fungi or lichen which is used for its medicinal properties. Apart from plant organs (root, rhizome, crust, flower, fruit, seed etc.), plant exudates are also herbal drugs (tars, gums). Herbal medicinal preparations are products obtained from drugs by special procedures: distillation, extractions etc. Herbal medicinal preparations are: fat oil, essential oil, plant juices, tinctures and extracts (dry, soft, fluid). Medicinal plant medicaments are made of standardized extracts of well known active principles which have doses dependant therapeutic effects. They are used in defined indicative sections and dosis regimes, formed on the base of clinical studies. Traditional medicinal plant medicaments are medicinal plant products, whose efficiency is not clinically confirmed, and the application is based on permanent usage and experience (it is necessary to prove that traditional medicaments have been used at least for 30 years, 15 years among EU and 15 years in the other countries), that it is harmless and it is used for the states which the doctor can not treat .

The paper gives a short overview of the most important potential of herbal medicinal materials that have an approved application in human medicine and which can be added to animal feed for use in different animal health disorders. The use of herbs is more current and all higher, in human and veterinary food industry.

Antimicrobial activity. Earlier studies indicate that many plant extracts have antimicrobial activity. According to Almas (1999), the extracts of *Azadirachta indica* (neem plant) chewing sticks are effective against *Streptococcus mutans* and *Streptococcus faecalis*. Hayat et al. (2004) studied the in vitro antimicrobial activity of *Zizyphus vulgaris* root extract against both gram positive and gram negative organisms using *Staphylococcus aureus* and *Escherichia coli*, respectively. Three different concentrations of the ethanolic extract of the roots were used and the activity compared with the standard antibiotics. All the concentrations showed excellent inhibitory effect on the growth of gram positive and gram negative microorganisms. It is evident, however, that in practice most individual herb or spice extracts must be included at a high concentration to observe effects comparable to those of antibiotics. This is only logical as many extracts contain a multitude of active substances. Among the aromatic plant species from family *Lamiaceae* (*Labiatae*), the genus *Origanum* and *Thymus* occupies a special position. Essential oils these plants are known to exhibit antimicrobial properties against bacteria (Schilcher et al., 2000). These properties are due principally to the major constituents carvacrol and thymol, which have possibilities as preservatives. Biological activity of essential oils depends on their chemical composition which is determined by the genotype and influenced by environmental and agronomic conditions.

Antioxidant properties. Oxygen is one of the most important element for life, growth and metabolism of living organisms. Autooxidation process results in the destruction of important molecules in diet formulations and also damages cellular tissues in living organisms. Therefore, autooxidation results in the formation of reactive oxygen

species and causes different kinds of diseases. Flavonoids and phenolic acids are widely present in higher plants. These compounds are effective against the deleterious effect of reactive oxygen species. According to Middleton and Kandaswami (1993), some compounds found in *Ocimum* plant have been reported to possess strong antioxidant activity. Cinnamon has antioxidant characteristics (Middleton and Kandaswami, 1993). Cinnamon extracts show antioxidant activity which is comparable to synthetic antioxidants, beta hydroxy toluene.

Anticarcinogenic activity. It is reported that leaves of *Ocimum tenuiflorum* possess anticancerous properties. Samresh et al. (2003) found that *Ocimum* suppressed benzo pyrene induced chromosomal aberrations in bone marrow and elevated glutathione (GSH) and glutathione-S-transferase (GST) activities in liver of mice. They also reported a suppressing effect of the plant on chemically induced hepatomas in rats and tumors in the fore-stomach of mice. Studies in mouse have also indicated the presence of flavonoids in *Ocimum* leaf extract. Flavonoid-enriched diet has a preventive effect on cancer, coronary heart disease and strokes. Thus, *Ocimum* can play a definite role in developing a cancer preventive drug.

Analgesic activities. Godhwani and Godhwani (1987) conducted studies by using methanol extract and aqueous suspension of leaves of *Ocimum tenuiflorum* on albino rats. The methanol extract (in doses of 100, 250 and 500 mg/kg) showed analgesic activity in mice as evaluated by the mean time taken to withdraw tail when brought in contact with the hot plate. Methanol extract had more analgesic activity than the aqueous suspension. The analgesic activity was attributed to amino acids resembling creatine and isoleucine, which have been reported to be analgesic.

Digestion-stimulating, laxative and antidiarrhoeal activities

Adstringents are preferentially used for treatment of subacute and chronic conditions. The adstringent action of tormentil rootstock (*Tormentillae rhizoma*) and bilberry fruit (*Myrtilli fructus*) is useful in the treatment of diarrhea (Wichtl M., 2002).

Blackthorn (*Prunus spinosa*), is a much branched, thorny shrub, with very dark coloured bark with sourish and astringent, blue-black spherical fruits. Approved by Commission E. The fruits are used as mild antidiarrhoeic. Blackthorn fruit consists of fruit acids, tannins, monosaccharides and oligosaccharides, while cyanogenic glycosides (amygdalin) are present only in seeds (Wichtl M., 2002; Gorunović M. and Lukić P., 2001; Arsić I. et al., 2007). Caraway (*Carum carvi*), fennel (*Foeniculum vulgare*), Coriander (*Coriandrum sativum*) and anise (*Pimpinella anisum*) have primarily carminative effects. Their savory flavor makes them suitable as a supplementary foodstuff, but they also have substantial medicinal action. Carvi fructus contain volatile oil (*Carvi aetheroleum*) and fatty oil. Caraway is the strongest and most reliable herbal carminative. It exerts spasmolytic action on the smooth muscles of the gastrointestinal tract and is antimicrobial. Tolerance of caraway is excellent: adverse effects have not been reported. Fennel tea is especially useful in dyspepsia and diarrhea (Thomson at Montvale, 2004;

Wichtl M., 2002; Gorunović M. and Lukić P., 2001).

Gingetol (*Potentilla erecta*)-Tormentl has high tannin content. *Tormentillae rhizoma* can be used in all types of diarrhea. The use of tormentil is especially beneficial in acute and subacute enteritis and enterocolitis. It is also helpful in summer diarrhea and, to some extent, in diarrhea of functional origin (Thomson at Montvale, 2004; Wichtl M., 2002; Gorunović M. and Lukić P., 2001). Bilberry leaves (*Myrtilli folium*) and berries (*Myrtilli fructus*) are used in medicine. Only the berries have antidiarrheal action. The bilberry has also proved to be an effective remedy for dyspepsia and diarrhea. Bilbery has also adstringent, antiseptic and absorptive action.

Oak bark (*Quercus cortex*) contains tannins and flavonoids, such as quercetin. Since oak contains astringent and antiphlogistic constituents oak bark can be used in therapy of diarrhea (Thomson at Montvale, 2004; Wichtl M., 2002; Gorunović M. and Lukić P., 2001).

Linseed is high in roughage materials, such as hemicellulose, cellulose, lignin and fatty oils. It also contains proteins as well as linustatin and linamarin. Linseed gruel is a good bulk laxative that increases the volume of the stool mass, causing a stretch reflex that stimulates intestinal peristalsis. These properties can be used for the treatment of animals in gravidity (Kostadinović Lj. et al. 2010)

Anticoccidial activity. The herbs especially *Azadirachta indica*, *Hobrrhena antidysenterica*, *Barberis aristata*, *Embelia ribes*, *Acorus calamus* and *Artemisia annua* have strong anticoccidial activity. Tipu et al. (2002) compared the anticoccidial efficacy of salinomycin sodium and neem fruit in broilers. They concluded that the addition of 0.3% ground neem fruit in boiler feed has tremendous efficiency in combating coccidiosis as compared to salinomycin sodium. They reported that neem fruit had compound margosate, responsible for the break down of Eimeria life cycle. Similarly, Allen et al. (1997) investigated the effect of feeding dried *Artemisia annua* leaves and its components to birds infected with Eimeria *acervulina*, *E. tenella* or *E. maxima*. When fed at a dose rate of 1% for 5 weeks prior to infection, significant protection was noted for both *E. tenella* and *E. acervulina*. Artemesia contains artemisinin which protected weight gains and reduced oocyst yields for both *E. tenella* and *E. acervulina*.

Weight gain and feed consumption. Previous literature shows that use of herbs in animal feed improved the weight gain of animals. These can be used simultaneously for treating parasitic diseases as well as increasing the weight gain and act as growth promoters.

Oregano (*Origanum vulgare L.*) belongs to the family *Lamiaceae*. In addition to other ingredients, it contains more than 4% essential oil which is mostly composed of two phenols: thymol and carvacrol in variable quantity. In addition to basic biological effects, such as antibacterial and impact of an increase in appetite, essential oil of oregano can be used as an alternative to antibiotic growth promoters in chickens (Tsinas C. and Spais B., 1999), pigs (Tsinas et al., 1998) and turkeys (Bampidis et al., 2005).

Conclusions

Using the experience of traditional and modern phytotherapy manufacturers of animal feed can improve animal health and thus the quality of food for humanity. Substitution synthetic antimicrobial and anti-inflammatory medications, and natural resources-medicinal and aromatic plant raw materials, based on scientific base. Medicinal plants compete with the synthetic drugs. As the world is becoming more advanced, new diseases are emerging in animals and human beings by irrational use of antibiotics and antimicrobial growth promoters (Tipu et al., 2006).

Given the ubiquitous tendency to "return to nature" in all spheres of life today, especially in the field of health (prevention and treatment), products with medicinal herbs with the right to occupy a leading place in modern phytotherapy. The usage herbs in the food industry is all more current and more, both in human and in veterinary practice.

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ECONOMIC AND AGRONOMIC ANALYSIS OF ORGANIC PRODUCTION OF TOMATO AND PEPPER

Nenad Pavlović¹, Milan Ugrinović, Milan Zdravković

Abstract

In Serbia, the vegetable crops are grown on about 284,000 ha which represents 9% of the total arable land. Tomato and pepper represent 8% of total vegetable production. Both species are of interest to fresh consumption and processing. One of the possibilities for increasing the value of production of the mentioned plant species per area unit is organic production with mandatory certification. Certified production is carried out with higher expenses, but the price of products is doubled comparing to the inorganic products. This paper analyzes the cost of production of tomato and pepper produced following the principles of organic vegetable production. Analytical calculation showed gain in tomato production in amount of 6210€/ha, with the return rate 41.4% and coefficient of cost-effectiveness 1.71. Pepper production has achieved a profit of 6,110 €/ha, with the return rate 43.33% and 1.76 coefficient of cost-effectiveness. Values of the above parameters indicate high economy of both analysed products.

Key words: *analytical calculation, economy production, tomato, pepper*

Introduction

Vegetable production represents one of the most intensive branch of plant production, which is reflected in high yields, realized gain, income. Vegetable crops have diverse species and production methods. Having in mind the capacity and the needs, the vegetable production in Serbia is still insufficient. Vegetable can take an important place in export of agricultural products. This is especially repeated to the products from certified organic production (Klonsky et al. 1994, Manivong et al. 2009). Serbia has favourable

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agro-ecological conditions for growing most of the vegetable species and the advantage of proximity of European market. Vegetable makes 9% of total planted area in Serbia, 11,31% of total production and 9% of total export of agricultural products (www.stat.gov.rs). There are 30 vegetable species intensively grown and used in Serbia today and it would be possible to use 150 (Markovic et al. 2007). The main economical characteristic of this kind of production is rapid turnover of capital which makes it very interesting for small producers, which still make the base of agricultural production in Serbia.

This paper aims to show the economy of certified organic production of tomato and pepper in the open field in the Republic of Serbia.

Methodology

The database used for this research, was the record book of the Institute of Vegetable Crops, Smederevska Palanka (accounting calculations), as well as records of costs and yields achieved in the production of tomato and pepper in 2010 at the experimental field of the Institute. Retail prices have been determined by the method of interviews sellers in Belgrade and Novi Sad, who sell certified organic products.

The economic analysis has been performed using a calculation method for the purpose of determining the cost and calculating basic indicators of the profitability of production for the analyzed vegetable species.

Results and discussion

The main feature of the development of vegetable production is the realization of economic yield, high nutritional and health quality of vegetables, which is achieved by applying suitable agro-technical measures, growing highly productive and resistant varieties, using good quality seeds.

According to the sowing structure of vegetable in our country it can be concluded that pepper and tomato belong to the group of the most popular vegetable. These are vegetable species that need intensive care and high investments during the production process. On the other hand, investments can be returned through high and quality yield. In our case, total yield of tomato was 25 t/ha and pepper 23,5 t/ha (Table 1.). Analysis of production for both vegetable species, which botanically belong to the same family, shows that their structure and the height of expenses during the production is very similar (Table 1.). Based on those values we calculated cost price per product unit for tomato and pepper 0,36 and 0,34 €/kg. These prices, with the mentioned yield, cover the production expenses. The expenses of the production are beside the income, one of the most important factors impacting the gain and the production. With the development of market economy they represent the important factor of competition (Bošnjak i Rodić, 2010). Record keeping required records of all costs of labor, and materials (inputs) consumed in the production. Just for the successful management of production, managers must always know the amount of costs, as well as their structure and dynamics (Kay et al. 2008). The analysis of individual costs (Table 1), shows that in both production processes (pepper and tomato), the largest acquisition costs are for

high quality planting material (Graf. 1.), which is the main condition for the safe and stable production. This cost can be reduced if the manufacturer decides to produce its own nursery. However, in this case the risk is much higher. One of the important items, looking at the amount of costs is the expenditure of labor force (Table 1, Graf. 1).

Knowledge of certain costs and their share in the overall structure of production is important for business decision making, when the economic analysis of production indicates the dominant group costs, which largely affect the cost structure of the finished product (Kanisek i sar. 2008.). It is known that production costs are not statistical categories. They vary, depending on the quality of used inputs and their prices. When planning future production, the structure of costs and revenues, as well as an absolute measure of performance, should be used to calculate the relative measure of the success of pepper and tomato production (profitability). Coefficient of cost-effectiveness is an expression of rational use of resources and in our case for tomato it is 1.71 and for pepper it is 1.76. The calculated values indicate that both the production cost.

Profitability of production is the effect of total investment in the production of tomato and pepper. Calculated coefficient is slightly higher for pepper 43.33%, while the tomato it is 41.4% (Table 3).

For the purpose of organizing and promoting the production of tomatoes and peppers, it is necessary to analyze those results that are a result of costs incurred. Economic analysis of the results achieved point to contribute to production volume and sales prices realized values of production. It establishes different relationships as indicators of quality investment (efficiency). The observed production of tomatoes in the realized yield of 25000kg/ha and sale price of 0.6 € / kg achieved a production value of € 15,000 (Table 2). The level of cost is € 8,790 / ha, and the realized profit € 6,210 / ha. The average production of pepper of 23,500 kg / ha and the sale price of 0.6 € / kg achieved a production value of € 14,100 (Table 2). The costs incurred during production are € 7,990 / ha, achieved profit is € 6,110 / ha. For the planned sale price of tomato of 0.6 € / kg, the profitability can be achieved when the yield is 14,650 kg/ha. That amount is 10.350 kg less than the actual yield. When the planned sale price of pepper 0.6 € / kg yield should be 13,317 kg / ha. For planned output of 23.500kg/ha, this value is 10.183kg lower. These data show that the realized yield indicates that the production of tomatoes and peppers in the open field, according to the principles of organic vegetable production is economical.

Conclusion

Tomato and pepper belong to the group of intensive vegetable crops and their production must be carefully economically analyzed and planned. Analytical calculation can be used as methodological base of the analysis. The calculated relative parameters of successful production of tomato are: coefficient of cost-effectiveness 1,71, rate of return 39.4%, an absolute indicator-profit with a value of €6,210/ha. In pepper production coefficient of cost-effectiveness is 1.76, the rate of return 44.7% and the realized profit is € 6,110 / ha. Achieved indicators are a result of growing pepper and tomato on the concept of organic cultivation technology in economic and market conditions in Serbia.

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Table 1: Cost of certified organic tomato and pepper production per unit area (euro / ha)

Costs:	tomato	pepper
	Per ha	Per ha
destruction of plant residues	10	10
manure	280	280
removing manure	30	30
basic processing	100	100
seed*	0	0
nursery*	4.000	5000
additional processing	50	50
pre-sowing preparation	40	40
trellises, foil	2000	0
foliar fertilizers*	30	30
spraying*	20	20
cultivation*	60	60
irrigation	120	120
irrigation system	800	800
labour*	800	1000
chemical protection*	100	100
allowed chemicals	150	150
certification	200	200
Total:	8790	7990

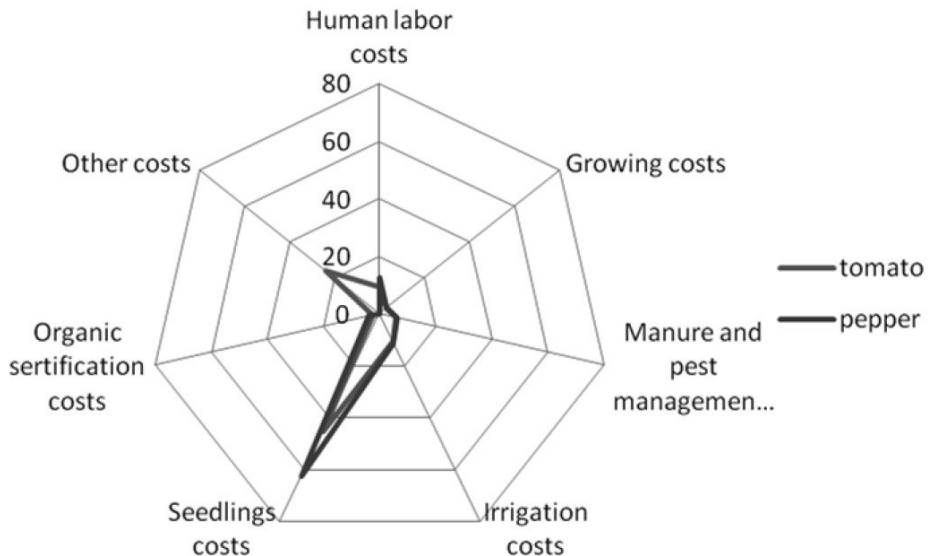
Table 2: Realized yield per unit area (kg / ha), the price per unit (EUR / kg), the value of production (Euro / ha).

	tomato	pepper
yield (kg / ha)	25000	23500
Price (eur/kg-piece)	0,6	0,6
Production value (EUR)	15000	14100

Table 3: Indicators of economy of production of tomato and pepper according to the principles of organic vegetable production

	tomato	pepper
Total cost (eur/ha)	8790	7990
Value of production (eur/ha)	15000	14100
Cost price (eur/kg)	0,36	0,34
gain(eur/ ha)	6210	6110
border of profitability (kg, pieces / ha)	14650	13317
business rate of profitability (gain on 100€)	41,4	43,33
coefficient of cost-effectiveness (e)	1,71	1,76

Graf 1. Partial costs of certified organic tomato and pepper production (%)



Economics of agriculture

SI – 2

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SEPARATION BETWEEN AGRICULTURAL AND FORTESTRY LAND

Mihailo Ratknić, Ljubinko Rakonjac, Milorad Veselinović¹

Introduction

In the past two decades, the multidisciplinary research of land area has been current. The problem of these researches is exceptionally complex and it requires a disciplined and continuous work of different professionals (soil surveyors, geologists, soil scientists, phytocoenologists, climatologists, typologists, ecologists, statisticians, socio-demographers, economists, etc.) in the aim to find out and utilize the reliable parameters for the definition of land area by quantity and quality. The final target is that such a defined land area is optimally utilized both from the social and from the economic aspects.

Key words: *clas amenities, bare land, afforestation, information system*

Material and methods

In forestry, the multidisciplinary evaluation of land is especially significant because the interests of forestry are interwoven, but often in collision, with the interests of agriculture, watershed management, electric power industry, traffic, town planning, wildlife management, etc. In the forestry of Serbia, the marked problem is that of bare land separation (regardless of the ownership) for forestry and agricultural production in hilly-mountainous regions.

Long-term planning for afforestation in this field is not possible due to spatially undefined plots. As this usually leads to mistakes when afforestation is done, we started identification and mapping of bare land in hill-mountain region of Raska (Sjenica,

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Tutuin, Raska and Novi Pazar) based on orographic, climatic, geological, soil science, Phytocoenological, erosion, socio-demographic and economical criteria. This kind of analysis gains more and more importance having in mind the change of attitude regarding area planing and moving its creation to local autonomy level.

Results and discussion

The criteria for the assessment of land suitability in forestry and agriculture are different. So, a land can be very productive if it is assessed by forest tree growth, but it can be extremely unsuitable for agriculture.

The classification applied in this paper is based on the international Framework for Land Evaluation (FAO, 1976), with the basic structure:

- suitability order, reflects the type of suitability
- suitability class, reflects the degree of suitability within the order
- suitability sub-class, reflects the type of restriction
- suitability unit, reflects the smaller differences within the sub-class.

Suitability order shows whether a land area is suitable or unsuitable for the intended use. There are three orders of suitability designed on the maps:

- **s u i t a b l e (P)** denotes the land area where the intended use is profitable and justifies the investments in afforestation, there are neither damage to land resources nor harmful effects of any kind,

- **u n s u i t a b l e (N)** denotes a land area which does not sustain the intended use,

- **s u i t a b l e c o n d i t i o n a l y (PU)** denotes a land area where economic return cannot be expected, so that the investments in afforestation are not justifiable, but still the establishment of forests, with all the multiple beneficial functions, is necessary (e.g. for the protection of spring area, erosion control, recultivation of spoil heaps, etc.)

Suitability class of a land area shows the degree of suitability and it is denoted by an Arabic numeral. According to FAO classification (1976), there are three classes in the order "suitable", and two classes in the order "unsuitable".

- **h i g h l y s u i t a b l e (P1)** denotes a land area which has no significant limitations for forestry or the limitations are minimal, so that they do not decrease the productivity i.e. the profit, and do not increase the input above the acceptable level (maximum value of the established discount rate for the land use),

- **i n t e r m e d i a t e l y s u i t a b l e (P2)** denotes a land area which has limitations in the use for forestry, which decrease the productivity or the profit below the profit which is expected in the class "highly suitable",

- **m a r g i n a l l y s u i t a b l e (P3)** denotes a land area which has serious limitations which endanger its use for forestry, so that the productivity or the profit are decreased, requiring investments which can only exceptionally be justified,

- **t e m p o r a r i l y u n s u i t a b l e (N1)** denotes a land area which has serious limitations which can be overcome with time, but which cannot be corrected with the present knowledge and acceptable price. The limitations are such that, at the moment, they prevent the successful land use,

- permanently unsuitable (N2) denotes a land area which has serious limitations, so that it excludes completely the possibility of successful land use for forestry.

Three major limitations are denoted on the maps.

The restricting factors are defined in the ecological, socio-demographic, economic and financial analyses of a land area:

a) **Ecological definition of land area**

Orographic, climatic, geological, soil, plant community, and erosion characteristics of the land are defined:

- **Orographic characteristics (o)**. Orographic characteristics are analyzed in detail for the areas intended for forestry. The appraisal depends on the gradient (n), aspect (e), and elevation (v). By the digitalization of the areas suitable for forestry, the combinations of factors are made possible. The cartographic presentation shows the areas with identical values of the "potential of local temperature" and "local temperature factor".

- **Climatic characteristics (k)**. In the previous papers, the analysis of climate was mainly used as a supplement to the researched ecological factors, without any crucial relationship. Mass decline of forest cultures caused by unfavorable climatic factors indicates that climate should be paid much more attention to, and if it is not a dominant factor, it is an equally important one in land appraisal. Consequently, the analysis of climatic factors deviates from the classical approach (so far used in forestry). Mean monthly minimum and mean monthly maximum air temperatures are analyzed, as well as mean monthly relative air humidity, noon relative air humidity, monthly rainfall, rainfall intensity in the vegetation period and rainless spells which also include the days with precipitation less than 1.0 mm, which was decisive in the survival of cultures.

- **Geological and pedological characteristics (g, z)** are determined by the detailed reconnaissance of the terrain and digging soil profiles, in order to observe the essential characteristics of the soil and parent rock: soil depth (d), skeletal soil (sk), parent rock (g), as well as other morphological characteristics which affect land productivity. Of course, the profiles are cut at the characteristic locations and forms of relief.

According to the general principles of soil class determination, all the soils are classified into eight classes. Special attention is devoted to the soils of V, VI, VII, and VIII classes.

- **Phytocoenological characteristics (f)** - are derived from the data on the existing vegetation. The map of potential vegetation is used as a key for the choice of tree species for afforestation.

- **Erosion processes (e)**. The description of present forms of erosion is given with the proposal for their control, as well as the recommendations for further activities from the standpoint of soil conservation.

b) Socio-demographic objectives of land area

Socio-demographic factors (d). The data on the population size are collected. The economic structure of the population is analyzed, and especially the share of agricultural population in the total population. Special emphasis is given to migration processes, their scope and aspects. The range of livestock number (s) is also analyzed per species, categories and sectors of ownership. The review of animal husbandry production is also given. The data are collected and processed on the structure of harvest and the average yield of agricultural crops. Also, the physical scope of current plant production (from ploughland, gardens, orchards, meadows and pastures) is also calculated. In this way, it is determined if the change of land use will cause the disturbance of the relations in the physical scope of agricultural production.

c) Economic and financial objectives of land use

The economic and financial analyses are a significant part in the separation of agricultural and forest land, in the aim of its optimum utilization. By the applied system of land capability appraisal, economic and financial analyses participate in the formation of suitability classes (indirectly, suitability order) which confirms the high significance of this analysis. First of all, a detailed financial analysis should be made: to determine the internal rate of yield and the term of return of the investment funds for all the alternative forms of production. In this respect, the comparison of agricultural production and the production of forest assortment is made, as an alternative aspects of economy on the soils of the fifth, sixth, and seventh class of fertility. Also, the evaluation of multiple benefits is also undertaken. The data base on seed sources in the region of Serbia serves for the choice of seed sources which can be utilized for the production of nursery stock for afforestation. The aim is such an organization of work which aims at the production of seedlings for the particular site, and with the optimum afforestation method. The database on the established forest plantations is a significant support in the choice of tree species, i.e. provenance's, for the afforestation of the particular site.

Experts sistem for relevant dicsion about optimal land use

Main dates that are relevant for land use decision should be :

Agriculture	Land capability class I -V (using space)
Landscape	National beauty, landscape regional importance
Natural protection	National parks, Regional natural parks, Nature reservate, Natural monuments, Memorial monuments, Open natural space monuments surrounding, Park-forests, etc.
Recreation/ tourism	Tourist paths, Scenery points, ski-paths, climbing paths, meadows, fields, etc.
Water flow region	Water flows, wells, main rivers, accumulations, channels, etc.
Infrastructure	Urban regions, roads, power electricity, etc.
Social-economic information's	Population trends, district, lends-registry, forestry-management regions, management unit, etc.
Forestry	Existing forests (shape, kind, mixture, function, condition)

The most of following information systems are based on use of GIS tehnology.

Creating database of seeds stands on the region in Serbia has for aim on object selection, which can be used like base for plant production for afforestation. That enables work organization on plant production for the residence, which is already known with a choice of optimal technique of afforstring. Also creating databases of risked forestry cultures, will represent significant tries choice, in reference to provenance, for afforstring certain residence. The expert system that has been developed will enable preparation for afforestation, and, now for the first time, move from declarative to operative organization of work – plant production from seed gained from already known seed stand (known provenance) for residence of known characteristics, and with choice of plants optimal production methodology and afforestation technology. There's the group of limits in experts systems for afforestation. Picture No 1 shows the plan of expert system for afforestation. GIS technology gives high possibilities of producing new information for combined data base of different levels, which enables optimal use of territories in hill-mountain territory-to become real. The space models can be used for predicting direct or indirect results, before giving final decision about using expanse. Applying the shown method on the territory of Sjenica, Tutin, Raška and Novi Pazar, the following condition, regarding the possibilities for land use in forestry, is found.

Table 1 Limitation of Expert system for afforestation

Land for afforestation	In existing forests, with special permission for planting
Limited land for planting	Part of bony class VIII, urban lands
Risk regions	National parks, regions with great importance for natural sciences, natural monuments, national beauty, land capability class I-IV
Potential regions	Important places for natural sciences, Regions with landscape importance in regional meaning
Priority regions	Rest regions

Table 2 Possibility of land use in forestry

Suitability class	Community			
	Sjenica	Tutin	Raška	N. Pazar
	Hectare			
Class "highly suitable"	37	192		
Class "intermediately suitable"	5241	8242	2636	1944
Class "marginally suitable"	4821	6397	8684	8533
Class "temporarily unsuitable"	3140	3140	6321	3316
Class "permanently suitable"	2044	463	160	264
Class "intermediate and marginally suitable"	3953	664	638	311
Class "marginally and temporarily suitable"				195

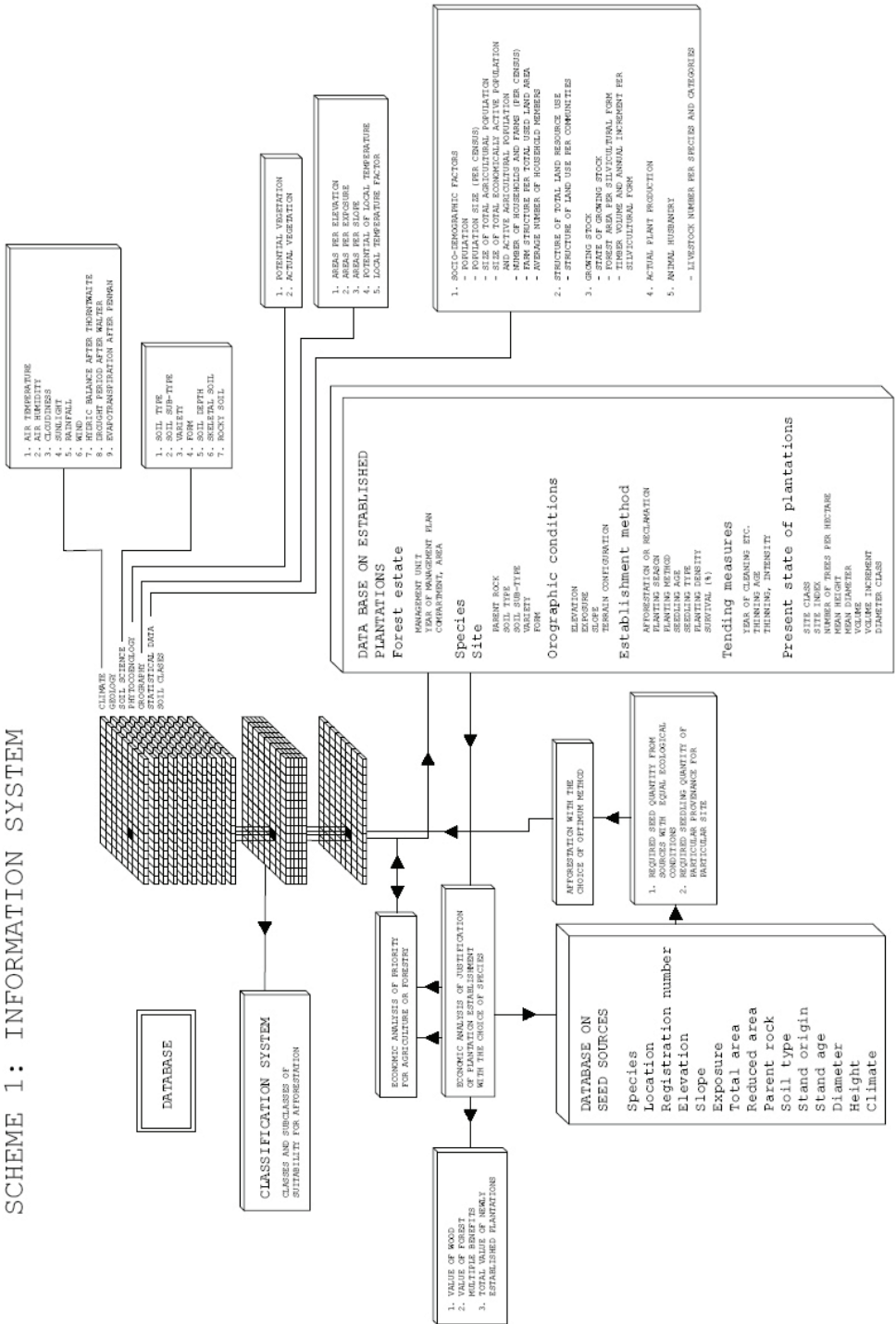
Conclusion

Some very important issues, regarding improvement of afforestation in Serbia are brought up. The priority goals are: changing the use of some agricultural land for the sake of preserving ecological balance, improvement of afforestation and construction of long-term production capabilities of existing and new forests, contemporary biological works solving the problem of water supply etc.. The important is valuations on existence of numerous conflict situations in space using (waiting for the solution) that are made because space-using regime was not existing. Some notice are strictly imperative, like for instance the evaluation that Serbia has not too much space for accumulations and that filling up of accumulations must be prevented with up-to-time biological work, since this will provide water supply and national survival. The development of Serbia in years to come is conditioned to changing the politics regarding afforestation of bare land and melioration coppice and degraded forests.

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SCHEME 1: INFORMATION SYSTEM



Economics of agriculture

SI – 2

UDK: 504.05/ 6:33

THE ROLE OF ECO-ECONOMY IN RECOVERING FROM CRISIS

Marina Luminita Sarbovan¹

Abstract

During the current crisis, the ecological aspects of the economy become more important, being one of the major issues because they are promising a healthy way of economic recovery. In order to become more efficient, in this branch, most of the reproaches coming from the farmers and are focused on the low subvention, or slow and too long terms financing flows involved in farming industry. In Romania, the state subventions also go for eco-rural-production, and financing this sector helps the recovery from the crisis, fact confirmed by the raising trend evolution of the bio-production and retail in our country. The trend is for the “green” factors of recovery to be diversified and implemented in all branches of activity.

Keywords: *crisis, subvention, “green” factors of recovery.*

Introduction

The overall sustainable development of the economy includes and integrates the economic growth and development of all activities, branches and sectors of the global hyper economic system. In close connection with the current world growth crisis, the ecological aspect of the economy becomes more important, being one of the major issues and promising a healthy way of economic recovery.

In the general context of global unsolved problems of all mankind, European Commission underlined long ago the major role of protecting the environment, in order to preserve life on our planet in best conditions, and the important role of green food production and the clean water, air and habitat, for the human health - in its long term signification.

For agricultural and rural recovery and development, the vision of the eco-economy involves a series of “green” production principles, “green” distribution and exchange, and definitely “green” consumption.

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In the eco-economics sciences, the rural development, its social and economic contribution in the macroeconomic system is one of the concerning problems.

To be concrete and more precise, eco-economy, the object of study for eco-economics, refers of how to reach the profit goals of microeconomics, the consumption goals of macroeconomics, the classic and even pre-classic welfare goal for all the economy, by not using soil fertilizers and ameliorative, pesticides, fodders, food additives, toxic ingredients for preparing food, non-safe substances in animal nutrition, adjutant substances for preparing fodders, non-safe products for cleaning and disinfecting the animal stables, in brief, to raise the standard up to a safer, “green” agriculture, the primary and most important sector of economy.

Because the agricultural secure development plays a crucial role for mankind, even an apparently small thing, such as using ecological seeds, of seed plants, or their methods of production cannot be left away from the authorities’ strategic measures and current actions.

When we analyze the ecological long lasting development of agriculture and its factors, we also have in mind the related phenomena, such as the poverty, the level of the technical endowment, the land ownership, and other polluting activities which are mainly generated by the lack of financial-investment process, unable to feed enough profitable incomes for the rural – agricultural enterprises.

In our country, most of the reproaches coming from the farmers in order to raise the efficiency of the ecological production are focused on the low subvention, or slow and too long terms financing flows involved in farming industry. It is now, not later, important that the traditional systems in agriculture and food production to convert into ecological production systems, and the enlarging of the “green” products markets in Romania and Europe, supports this trend and necessity on steady economic basis.

Methods

The methods of economic sciences, applied to the agricultural studies, are based on the critical observations of the market forces.

Under the current recession situation, the market mechanism alone is not able to assure the Romanian recovery from the crisis, and the evolution of society requires the state intervention. The observations are grounded on the statistical results of the business. The global competition is stronger than ever and it originates a process of polarization of the economic activities, taking place worldwide. Society and authorities must take action implementing appropriate strategies designed to help the small farming and the small business to survive.

The evaluation in rural and agricultural field is based on index, as quantitative tools able to back-ground the strategic plans of long lasting development. For our country, the reference to compare the local realities with is still the average of the European Union.

Results and Discussion

Our debate comes from an empirical observation upon the cost structure of the agricultural product, no matter its origin: we generally pay the total expenses, starting with vegetable production, as a sum for seeds, chemical fertilizers, organic fertilizers, (compost from manure), pesticides, salaries, mechanical/technological factor. In Romania this is the case: many rural producers are small and they choose the cheapest cost solution for their result.

If each and all these cost elements are cheaper in the ecological version than the chemical (synthetic) substitute, than, a logic option of the rural manager of one farm would be to choose an eco-production, since it is well known that the current prices for bio-products on all markets are higher, and the net profit will arise. The ecological farmers use less chemical fertilizers, or ever they replace an expansive chemical fertilizer with a cheaper organic one, gaining quality and saving costs. It is true, poverty and scarcity of credits push them to do so, but the result is a rising of ecological production in our country.

This is even more evident knowing that in Romania and other Balkan countries, the state subventions also go for eco-rural-production.

Nevertheless, the price/quantity question still persists for the macroeconomic decedents, who are in the position to release financial support or aid-schemes, because we do not have a fix extent of the aggregation in the production-distribution-consumption chain, or a limit for clustering in industrial, rural, or service-providers processes; for example, it is possible that, taking the European (Union) case, the agglomeration of production which brings a theoretically arithmetical proved raising efficiency, could limit the rural clustering to a certain area, or to a certain structure, which can only be increased by chemical or synthetic means.

This is where the eco-economic tools of the agricultural policy must interfere, in order to bring the aggregate profitability and competitiveness up, to the same level as it could appear in a singular medium farming example of ecological production.

This example reveals the constrains of the current legislation, which does not give special subventions to agricultural clusters, but creates the need of associative forms of organization in this branch of economy.

A special problem of eco-development in agriculture remains the funding of the process, because we here have to deal with the long term income which can be in opposition with the short term income. In other words, the rural permanent profit (income) of the business is a sinuous function, going up and down, on medium and short terms (years or months), in discrepancy with the statistic situation of bio-products sales, and it is most likely that a banking system to interfere with the permanent need of financing is required. If so, the bank system deals with the permanent income/loss issue, on the background of existing monetary and fiscal legislation, while the market measures the relative income/loss result, obviously, in close connection with the consumers.

Global current structure of the macro-economy owes a relatively degree of connection among its national entities or corporations, as major players on the markets, but on the other hand, discrepancies continue to evaluate and higher competency pushes the non-profitable

activities out of the market; this knowledge about economic motion determine the economic agents to expect fluctuations of their incomes and to save, and as a consequence, the state interferes, to set up the strategy of recovery. The state intervention is more efficient based on a consumption model, because the consumption function could not be as affected as production during the activity fluctuations.

This assumption is in Romania confirmed by the evolution of the bio-production and retail, having a raising trend even under the negative growth evolutions of economy in 2009 and 2010.

The economic crisis enlivens in agriculture the main tool instrumented by the authorities in order to re-balance the macroeconomic slowing-down; this is the financial injections from the public sources: local, national, and European lines are likely to be directed to the edge-points of the economy, which multiply and accelerate the favorable effect of supplementary resources.

Foreigner financial support is most important for the Romanian crisis case, being recommend the best connection to the European and IMF founds, able to support and warrant that the public sector will carry out its functions and more than that, will draw up the entire economy, and agriculture in the first place.

It is undoubtedly that agriculture and rural sector of our country, but not only them, would not have good production and results by cutting the subventions.

The development of the agricultural eco-economy is subdue to a particularity of rural sector in general, which is the different periodicity of activities; for instance in zoo-economy there are longer time-frames of economic returns, while in IT services for agriculture the economic cycle time-frame is short.

Originating in the lack of trust in stability and steady returns, the general believe in short-time revenues is widely spread across business, and this consolidates the practice of a “safety plan” for the individual (or macroeconomic) interventions in the direction of shortening, or dividing into short parts the rural and agricultural activities, in the same manner as all business does.

Upon the pressure of uncertainty and connected to the global markets potential impact, defining the permanent income as an income anticipated and expected to be received along many years in the future, more than a lifetime, is an idealistic approach; in Romania, rural population holds a large share: 40 % of the whole, and their incomes are low.

We believe that it is not realistic to rely on the savings of rural population to finance the costly and long term agricultural eco-economic process of production and retail.

We can conclude that only on basis of the hypothesis that the revenues are a share of the total result of the rural eco-economic sector, and the contribution of the rural sector in Romanian economy is decreasing in 2009 and 2010.

Maintaining the previously proposed strategies, based on the European model of long lasting development designed by Lisbon Strategy (2000 and up-dated), all political measures should ensure an effective, coordinated participation at the common effort of development.

Conclusion

The UN evaluation of Millennium Ecosystems (MEA) and The Red List of International Union for Conservation (IUCN) draw our attention to the threatened species, to the loss of wet areas and virgin forests, and excessive fishery, as definitely originating factors of economic crisis; an international legislation and regulation could stop the wasting of the natural potential on the entire planet. This is why, all the national authorities are to take part of the overall actions of recovery by “green” measures.

The role of the Eco-Economy in recovering from crisis is important in our country too: if today the eco-agriculture holds only 2% (by the end of 2009) of the total area of 9 million ha cultivated in our country, the estimation is to raise up to 20% in 2015, but only under the restriction of a permanent subvention directed to bio-agricultural production.

More than 90% of Romanian bio products go now to export, and this situation re-balances the foreign trade, but frustrates the local consumers; this is why, another goal of the eco-economy is to priority serve the national market, as long as many consumers are forced to choose from the foreign offer of the local market, in the absence of the Romanian merchandise.

For the time being, the eco-products go out mostly as raw materials (grains of wheat, oat, soy bean, barley, pea, mushrooms, forest fruits, honey, sun-flower oil, and others), and the local industrial processing would add value and increase the national results.

More than 1800 traditional and ecological products are attested and there are thousands of firms working in the national eco-economy, although the certification is very strict, in order to eliminate the pollution factors from the final products.

The National Program of Rural Development is the main instrument of eco-economy policy and it gives to ecological agricultural production a yearly subvention, including the certification fee. Also, to speed the processing, we benefit of a regulation regarding the parallel processing of conventional and ecological production, which was set up.

A raw estimation shows on the Romanian market a 20% higher price for ecological products compared to the conventional ones, and an important goal would be to diminish that gap. It is this higher price that keeps a small bio-market in our country: 1-2%, compared to 8% which is the European average for food and non-food bio-products.

The objectives of The Development Strategy of Ecological Agriculture in Romania confirm the necessity of expanding the cultivated areas in ecological conditions, which for us might be cheaper, and more competitive.

The bio-fuel production also brings a new trend for the national recovery, as the large-scale cheap solutions are implemented in production. In the eco-economy project, our country delivers bio-fuels, such as bio-ethanol, produced from field-cereals; this bio-component is included in the conventional fuel, to reduce the carbon-dioxide emissions, and brings added value to macroeconomic results.

These already opened ways meant to turn the ecological production and distribution into a benefic factor of recovery are expected to be diversified and implemented in all branches of activity, such as “the green technology” (a less perturbing technology), or a stronger responsibility regarding the short and long term effects of economic activities.

Even if the consumption sector of green economy brings quicker and higher profits, the ecological production owes a basic role inside the sustainable eco-growth process, and this is why the strategy which encourages only one sector will turn into a certain risk.

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Economics of agriculture

SI – 2

UDK: 339.13:631.147 (497.7)

ORGANIC FOOD SUPPLY CHAIN – THE CASE IN MACEDONIA

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Abstract

The organic sub-sector in Macedonia follows an industrial model of agriculture and its development is mostly based on expectations of market price premiums. The organic farming community is very small and at the very beginning of the learning curve. In these circumstances supply is seen as the biggest problem of developing a market. The research involved analysis of consumer's perceptions and needs of organic agriculture, also. It focused more closely on potential for export market development, but based on opportunity of developing a domestic market.

Farmers are not ready for export yet and any potential initiative should be taken with organization of collective capacities. The success of any endeavour highly depends on the increase of transparency within the organic community. Development of the domestic market should be given more priority at this point as it has more chances of short term success and would serve as a foundation for eventually accessing an export market. Main focus in this paper is put on organic supply chain in Macedonia and preferences of domestic consumers' about demand of domestic organic products.

Keywords: *Macedonia, organic, potential, market, supply chain, domestic.*

Introduction

The organic agricultural production as a concept of the farm in which all the **components: the soil, the plants, the animals are affecting the maintenance of the stable coexistence.** .

It could be identified several driving forces that motivate people to initiate organic production as follows:

1. The organic production is usually motivated by the consumers and market. The consumer in this case dictates how the food supposes to be produced, processed manipulated and sell. The products are clearly identified, certified and labelled.

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2. This could be stimulated by the state and its institutions. In the EU there are subsidies generating abilities for the environmental safety as well as the reduce of the pollution of the surface water or creating of areas with the particularly biological diversity.

3. The third stimulation for the organic farming is when it is initiated by the farmers themselves. Some of the farmers do believe that the conventional production is unsustainable so they've created alternative methods production with an aim to improve their family's health and the farms economy. The products are not always sold on the market, or it is selling without price differentiation without certificate. In developed countries the small farmers are using the direct distribution of non-certificate organic products to the consumers.

Usually manufacturer's use set of intermediaries to make their products available for the use or consumption (Kotler & Keller, 2006). Intermediaries smooth the flow of goods and services by providing several advantages to producers as the large number of producers lack the financial resources to carry out direct marketing and intermediaries have many contacts and experience to offer the producer more than it can achieve on its own. (Coughlan et al., 2001) The analysis of the literature on distribution channels of organic products suggests that there is no common classification of distribution channels of organic products.

Supply chains of organic products are often considered as alternative supply chains, which are shorter, more locally oriented, and in which the producers and consumers are more tightly connected to each other than those in the conventional food supply chains. In spite of this, the involvement of retailing groups into the organic supply chain has increased the market share of organic product in many European countries (Fin food 2003a, Hamm et al. 2002).

Usually world wide organic products are selling across the channels with low demand, like specialised shops for healthy food or directly from farm. Besides the fact that this sector is the fastest growing food sector in the world it is very important developing of other distributive channels. Historically looking, organic food was available only in row products like grains, meat, milk, eggs, fresh fruit and vegetables and in low processed products like dried fruit and vegetables, dried spices plants etc. In this moment is very important to mention that structure of organic food distribution is mainly in special healthy food part of big supermarkets (50%). Important channels are specialised shops for healthy and organic food (45%), and the rest of the organic food are distributing across direct marketing (5%) for catering in restaurants, hospitals, hotels etc.

Low offer of organic food by quantity and assortment, didn't allowed some important marketing strategies to the development of organic sector in Republic of Macedonia. Low domestic products are limitation for production of organic products in Republic of Macedonia and from the other side low offer are limitation factor for exporting. In this moment, the main motive for organic food production is subsidizing of organic production from the government. If the government stop with this subsidizing, producers will be unmotivated for organic food production. Insufficiencies of organic

products by domestic production are limitation factor for possibilities of using of more attractive distributive channels on permanent base.

Specification of organic food supply chain in republic of Macedonia

This paper is result of project ordered by Ministry of agriculture. This project was researched completed supply chain management from farm to the fork and all participants in this chain, from suppliers to the consumers. The main aim of this project was to identify weaknesses of the chain and to detect reasons for low dynamic of organic production development. The main advantages of organic production in Republic of Macedonia are very satisfactory yield crops, protection of nature and landscape, almost the same agro technical measures like conventional products, higher market prices, toward future oriented production etc.

The biggest weaknesses of organic production are: expensive production compared with yield crops, low price for organic food, low quantity which not allows export, bad eating habits, low cooperation between producers and other parts of distributive network, week market organization, low level of education etc.

There is many problems along the chain, from the suppliers till consumers. Like main problems in production process were mentioned supply of organic fertilizers and organic protection materials. Another problem is unavailability of biological materials and that why is important to have allowed list of materials appropriate for using in organic production. For solving of these problems it is necessary establishing of specialized shop for organic materials and protection instruments.

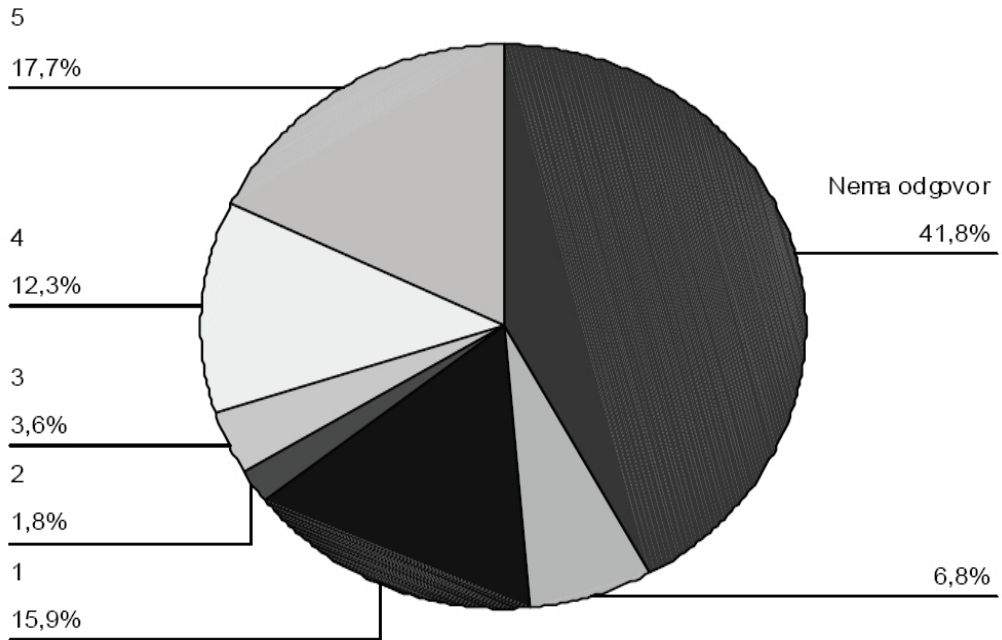
Organic fertilizers and protection instruments are not regulated in this moment, but in the moment are preparing the rule book about organic fertilizers. In meantime it is very important finding way to register imported organic fertilizers. Additional problem is higher price of these fertilizers and other materials. Another problems regards organic production is certification process and production price. Certification process is very complicated, expensive and long term. Besides the fact that ministry of agriculture pays 50% of the certification price, this process is still expensive for the farmers.

When we talking about production cost, evident is that Macedonian farmers don't know how much organic production compared with conventional production of the same product cost. According to some farmers organic production has lower productivity 30-50% compared with conventional products productivity. Representatives of distributional network approved that Macedonian market can't absorb price higher then 30% plus of the same conventional products price. The fact that organic products in Macedonia are selling in the same prices like conventional products, besides their lower productivity, are strongly demotivation factor for Macedonian organic producers.

Low quality products appearance in the market, and their inappropriate sanctioning, causing problems to the regular producers. For example, honey made by glucoses putting down the price of organic honey. In general, organic production is not so bed, because conventional production is facing problems, too. Very big problem is processing and selling of organic products. The most important problem of organic supply chain is organic products

distribution. Macedonian organic products are very unavailable in distributional network. That it is very difficult to find domestic organic food in the shops thinks 17,7% of interviewed consumers which marked with mark 5 (very difficult to find in shops) the question about organic food availability.

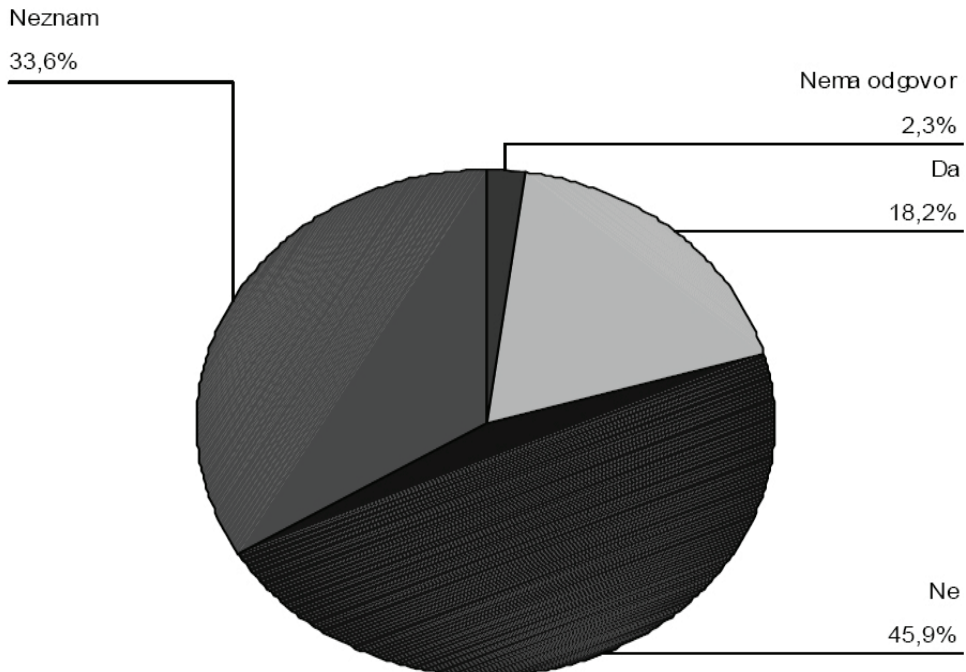
Graf No.1 - Availability of organic food in the shops



Source: Personal research

Representatives of distributional network indicate many problems which are important for this segment of supply chain. Their biggest problem was quality control and very weak organization and unification of organic products offer from the farmer's side. If consumers pay more for organic food, they should be sure in the products quality. The consumers understand value of organic food, but the quality, assortment of the organic products and their continuity are problems. Distributors was prepared to organize presentation and degustation by their own, but only if they have continuous supplying. Organic logo is also, very important and it should be known to the consumers. It is very important to know who guarantee for the quality with this logo. Distributors can guarantee display of the organic products, but not packaging and certificating. For this reasons trust building is necessary.

The dilemma is how to recognise and buy organic food from the huge supermarket chooses? Ministry of agriculture was prepared some logo, so the next question to the consumer was:

Graf No. 2 - Are you familiar with organic food logo

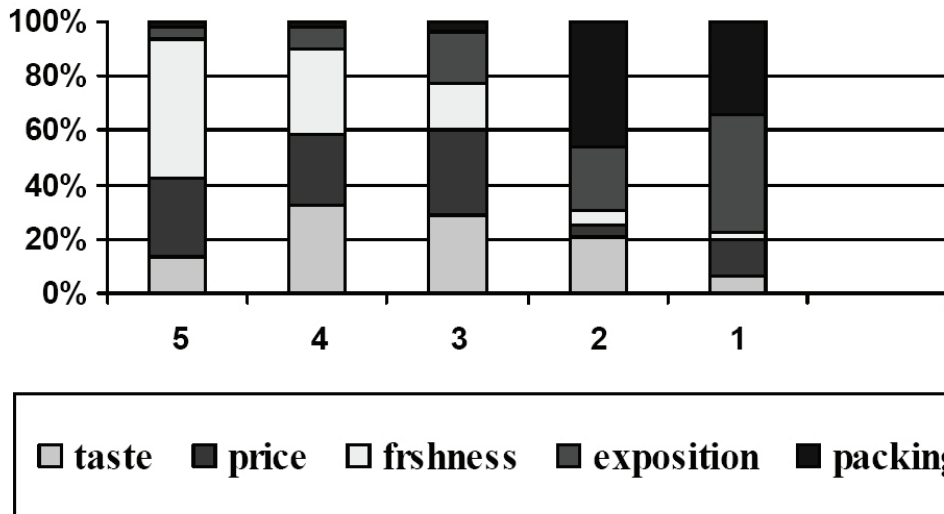
Source: Personal research

Significant number of consumers says that they didn't know Macedonian organic logo (45,9%), only 18,2% knows this logo, but very often they are not sure what is exactly organic logo and they mix them with Macedonian quality logo.

Distributors think that farmers have unrealistic requirements regarding the price which are higher than 30% more, which is an acceptable price. Distributors have problems regarding certification and fulfilling the requirements for organic food selling. For establishing of regular basis cooperation between distributors and producers the preconditions are following: existing organic products list, their quantity and producers, defining the way of communication (with direct producer or with association of producers), supporting of in-store activities (with education materials, exposing of counter with degustation possibilities during the weekends etc.). It is quite understandable that the main precondition is fulfilling of basic selling conditions like appropriate packing, bar-code and necessary certificates.

If we are analyzing the price like factor we will realize that it is important, but not most important.

Graf No. 3 - Gradation of factors which are important in buying process



Source: Personal research

According to the inquiry results we can make gradation of buying factors by their importance. The freshness of the product is most important factor, then price, taste, exposition in the store and packaging is less important factor. But no matter where organic products are selling it is necessary their clear labelling and organic logo must be putted in the visible place, also.

Conclusions

From the realization of this project several conclusions regard “from farm to fork process” is occurring. The general conclusion is that there is many weaknesses in organic supply chain. There is very weak horizontal and vertical integration along the chain which result with low synchronization and low increasing of the production besides the financial support from the Ministry of agriculture to the organic sector. The producers think that financial support are not simulative enough and lower productivity in combination with higher cost can not be cover with this support. Their strongest production motives are existing hope for higher price and desire to produce health food. Problems can be grouped in several groups:

- 1. Production problems** – problems with supplying of fertilizers and other materials important for production can be putted here caused by low regulations, low educative materials regard this and high prices of the material, also.
- 2. Price problems** – calculation of production cost compared with appropriate conventional products will give clear view of existing situation.

3. **Distribution problems** – unorganized and inequality offer from the farmers is the biggest problem to the distributors.
4. **Promotion problems** – recognising of organic logo is very important. Consumers should be more informed and educated.

There are several very important open questions like regular basis distribution, appropriate packaging, marketing education to the producers etc. which should to be done before starting of serious informative campaign for organic food.

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ECONOMIC EFFECTS OF CATTLE MEAT PRODUCTION OF DIFFERENT GENETIC PROVENIENCE IN MOUNTAINOUS AREAS OF NORTHERN KOSOVO AND METOHIA

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Resume

In this research we examined the influence of two different genotypes (Simmental and crossbreed of Simmental and busa) on: weight gain(y), feed consumption for weight gain(x) per month during the fattening period average productivity (A.P.), represented by relation of total weight gain and consumed nutritive units, marginal weight gain (M.G.), which represents ratio of increased weight gain and increased input of nutritive units, as well as weight gain elasticity for achieved production level i.e. ratio of proportional weight gain increment and proportional increment of nutritive units during the fattening period. Fattening results show that cross-breed F1 achieved lower daily weight gain for 11,24% and higher feed consumption per growth unit (7,041 : 5,975) than Simmental cattle. Average productivity has a beneficial trend in Simmental cattle in comparison with cross-breed F1 generation. Coefficient of correlation among feed and weight gain during the fattening period in cross-breed was 0,733, while in Simmental breed it was 0,569. The achieved economic effects of fattening are a consequence of genetic predisposition of genotypes investigated, since fattening process evolved in identical conditions, so that non-genetic variance could be conditionally neglected.

Key words: *Simmental breed, Busa, cross-breed, weight gain, economy.*

Introduction

Cattle meat represents remarkably important foodstuff for nutrition of citizens in Kosovo and Metohia, since of total amount produced on cattle meat comes 43%.

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However, although present on this territory in higher amount than other kind of meat, total amount of meat produced is small and insufficient to satisfy population demands (*Statistical office of Kosovo 2009, Đorović et al. 2010*).

Low cattle meat production is a consequence, before all, of a bad breed structure, in which, autochthonous busa breed participate with more than 40% (*Spasić et al. 2010*).

Being that cattle Busa (because of small exterior dimensions and weight, late maturation and weak feed utilization) represents bad material for the production of large good quality meat amounts, producers tend to perform an alteration of the breed structure by crossing Busa cattle with high productive breeds.

The basic goal of this research was to compare the influence of different genetic potentials in identical conditions, on economic effects in the production of meat.

Material and methods

Investigation of economic effects of cattle fattening was performed in the area of Zubin Potok municipality. For the research 37 calves were purchased from the local market, wherefrom there were 20 Simmental heads and 19 Busa x Simmental crosses. During the purchase only animals suitable for fattening were selected. During the fattening period animals were kept in a tied stall housing system grouped by body weight. Daily diet was arranged according the average body weight and feeding was group performed with registration of feed consumed, which derived data regarding the total amount of feedstuffs consumption, that is to say, nutritive units per 1 kg of weight gain.

The first weighing of cattle was performed in the day 30, after the beginning, thereafter weighing was performed every 30 days and, finally, at the end of the fattening period, so that it was possible to follow the changes regarding the weight gain of cattle.

The data processing was performed by the implementation of adequate mathematical-statistical methods (*Stanković et al. 1990*). The significance of coefficients of dependency r_{xy} was computed by using the t-test. The fattening period lasted 213 days.

Results

Genetic potential within the meat industry is very often limiting production factor, with respect to fattening economical effect.

Genetic abilities of food transformation into the weight gain per months of fattening period and examined genetic groups has been given in table 1.

Table 1. Average daily feed consumption and average daily weight gain

	x		dx	y		dy	y/x (PP)	dy/dx (MP)	$E=(dy/y) / (dx/x)$
Month	Nutritive units			Gain			Average productivity	Marginal productivity	Productivity elasticity
	kg	%		kg	%				
Simmental breed									
1	5.00	100.0	-	0.982	100.0	-	0.196	-	-
2	6.51	130.2	1.51	1.278	130.1	0.296	0.196	0.196	1.000
3	6.67	133.4	0.16	1.282	130.6	0.004	0.192	0.025	0.130
4	7.30	146.0	0.63	1.284	130.7	0.002	0.176	0.003	0.009
5	7.65	153.0	0.35	1.275	129.8	-0.009	0.167	-0.025	-0.155
6	9.03	180.6	1.38	1.291	131.5	0.016	0.143	0.011	0.078
7	9.20	184.0	0.17	1.210	123.2	-0.065	0.132	-0.382	-0.043
Crosses (simmental x busa)									
1	5.46	100.0	-	0.813	100.0	-	0.148	-	-
2	6.82	124.9	1.36	1.096	134.8	0.283	0.161	0.208	1.296
3	6.94	127.1	0.12	1.112	136.8	0.016	0.160	0.133	0.823
4	7.69	140.8	0.75	1.147	141.1	0.035	0.149	0.046	0.309
5	8.11	148.5	0.42	1.189	146.2	0.042	0.146	0.010	0.686
6	9.12	167.0	1.01	1.176	144.6	-0.013	0.129	-0.012	-0.100
7	9.58	175.4	0.46	1.099	135.2	-0.077	0.115	-0.167	-1.458

Besides average daily nutritive units consumption and realized average daily gain per months, the table contains absolute and relative values of two features, then marginal fattening effects, relation of nutritive units utilization and achieved weight gain, an at the end elasticity coefficient of physical production volume has been determined. On the basis of obtained data aiming at determination of food transformation into the weight gain dependency per breed, following basic parameters have been calculated:

Tendency of nutritive units consumption (x) and weight gain obtained (y) by months of the fattening period, subsequently average productivity (AP), marginal gain (MG) and weight gain elasticity for an obtained production.

An average productivity represents a ratio between total weight gain and nutritive units consumed. Marginal productivity represents relationship between an increased weight gain and an increased investment of nutritive units.

The elasticity represents a relationship of the proportional weight gain increment and proportional increment of nutritive units during the fattening period.

From the table it can be noted certain processes and tendencies that could not be characterized as breed features of investigated animals.

It is obvious that breed genetic potential has not been expressed, since animals differently undergone through different fattening conditions and since they weren't uniform regarding the stature and body weight

Average productivity of 0,1673 has a more favorable tendency in Simmental animals versus crosses of Simmental and Busa whose coefficient averaged 0,142. Elasticity coefficient values in Simmental breed particularly has been expressed at second add-in point, while in crosses at second and third.

The animals of booth groups at add-in point 5 and 7, and 6 and 7 demonstrate a low degree of elasticity below zero, which is connected with a presence of another limiting element in the fattening process that restricted further feed investments and depicted an upper profitability limit of feed transformation into the weight gain.

It stands to sense that in booth investigated groups some similarities exist in appearance motions but not with the same intensity, where quality differences that cause a different economic results due to different nutrition units consumption and animal prices, could be neglected.

The consumption of nutritive units for the unit of weight gain by breed and fattening phases has been presented in table 2.

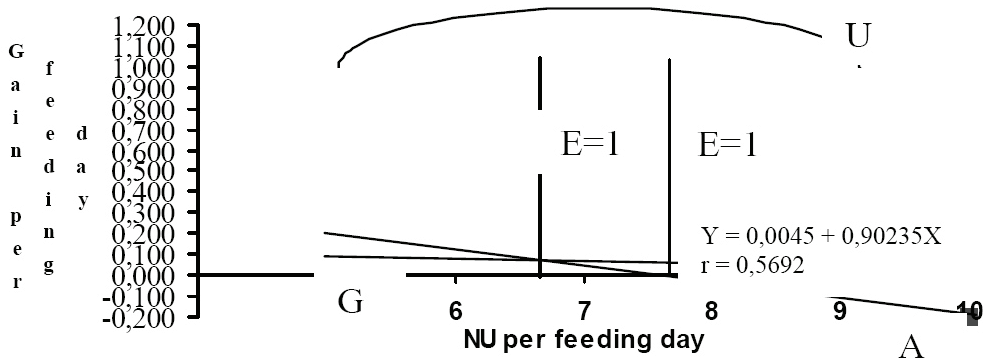
Table 2. Nutritive units consumption for kg of weight gain

Indicators	BREED	
	Simmental	Crosses (simmental x busa)
I phase	5,130	6,363
II phase	6,558	7,483
Average	5,975	7,041

During the fattening period cattle consumed average 6,473 nutritive units per 1kg of weight gain, but as it can be seen, there are significant differences regarding this feature Similar results quote *Milutinović (1977), Jovanović et al. (1992) and Koljajić et al. (1995)*.

In actual feeding and housing conditions at whom research has been conducted with Simmental cattle the top weight gain is achieving at fourth month as it can be seen from graph 1.

Graph 1. Variation of total terminal and average daily weight gain of simmental cattle



At a point where marginal production reaches a zero, maximum weight gain has been accomplishing. Regarding to this a question arises how much feed is necessary to spend per one animal. An answer is located within the context of second stage function wherein:

$$E < 1 \text{ i } E > 0$$

If necessary to achieve highest weight gain, feed consumption should be increased to 7,30 NU per feeding day, because this amount of feed accomplishes the highest gain of live mass, as it quotes **Drobac (2008)** in his theoretic considerations. In Simmental x Busa crosses feed consumption should be increased to 8,03 NU per feeding day, when the highest weight gain has been accomplishing (graph nr. 2)

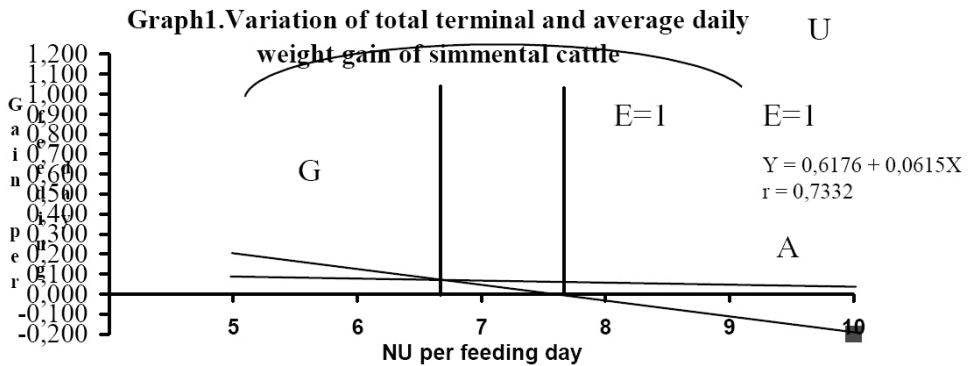


Table 3. Economical-financial results of cattle fattening (in €)

INDICATORS		Per 1 fattling Euros	
		Simmental breed	Crosses F_1
I	Expenses	503,4	483,8
1	Material	485,9	466,3
a)	Basic	451,9	430,3
	fattening cattle	210,6	181,1
	feed and bedding	241,3	249,2
b)	Auxiliary	11,5	13,3
	Medicine	8,6	10,4
	Rest	2,9	3,1
c)	Services	22,5	22,5
	Tractors	7,8	7,8
	Trucks	5,5	5,5
	Interest	9,1	9,1
2	Amortization	9,4	9,4
3	Workers salaries	8,1	8,1
II	Revenues		
	(live mass – redemption price)	696,9	583,2
III	Profit accomplished	193,4	98,6
IV	Taxes and contribution	17,3	8,9
V	Accumulation	176,1	90,5
VI	Cost price		
	(1 kg live mass)	1,1	1,2
	Selling price	1,55*	1,47*

* Source: /www.stips.minpolj.gov.rs

Total financial result in cattle fattening is positive. Positive differences are significantly advantageous in Simmental cattle and similar conclusions present *Cvetković et al. (2006)*.

From all above presented it could be concluded that during the fattening process genetic potential for feed utilization, was considerably pronounced in Simmental cattle, which determined cost-effectiveness of the breed.

Conclusion

During the fattening, cattle crosses achieved worse daily weight gain from cattle of Simmental breed for 11,24%, which indicate order of economic benefit from investigated genotypes in the production process-fattening.

The consumption of nutritive units per kg of weight gain is lower in cattle of Simmental breed in relation to crosses (7,041). The cost-effectiveness here has been accomplishing by savings of nutritive units in relation to crosses

An average productivity in Simmental cattle had an optimal tendency, similar to cattle crosses that had the same tendency.

Correlation coefficient between feed and weight gain during the whole fattening period in crosses of Simmental and Busa amounted 0,7332 and in Simmental cattle 0,5692.

An optimal point of feed consumption and weight gain realized in Simmental cattle is 6,51 NU and 1,278 kg of weight gain and in crosses 7,61 NU with 1,47 kg of weight gain.

The economic results accomplished during the fattening are a product of the genetic potentials and fattening conditions.

On the basis of above elaborated it can be concluded that genetic potential of investigated cattle in existing environment defines cost-effectiveness and that is necessary to consider selection of adequate breed of fattening cattle.

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USE OF REGION NATURAL FEATURES IN RURAL TERRITORIES MULTIPURPOSE DEVELOPMENT

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Abstract

In article on the basis of the short climatic characteristic conditions is shown that, in the region there are rather serious preconditions for the rural territories organization multipurpose development, including rural population improvements, and rural tourism, under condition of creation in their borders a necessary infrastructure. Also potential directions of rural territories multipurpose development is examined by creating a health rehabilitation center.

The basic directions of improvement and medical rehabilitation of rural population are defined on an example of Trunovsky area, typical rural municipal area of Stavropol Territory. It is given an annotation of natural medical factors of rural territories rational use. The main purpose is the search of financial possibilities of placing in Trunovsky area territory an inter-regional medical-improving complex which should become rural, using and developing advantages and possibilities of rural territory and rural tourism.

Key words: *Rural territories, multipurpose development of the Russian rural territories, agro tourism, «growth points» rural tourism, a recreant, a recreational product, a medical-rehabilitation complex, natural medical factors.*

Introduction

The south of Russia is traditionally presented by set of rural territories in all variety of its geographical, natural, climatic, demographic features, basically branches of agro-industrial complex development. First of all, it is grain cultivation, commercial crops, and also thermophilic vegetable cultures, gardens, small fruit acreage and vineyards, primary or deep processing of received production.

Above mentioned concerns Stavropol Territory too which ground space increasingly is presented by populated rural territories with an only exception that on this region more than in

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other regions of the North Caucasian federal district the dryness of a climate, frequent and dry hot wind phenomena are appeared. In a total area of its agricultural grounds almost the quarter is presented by haying and pasture areas, basically not plowed up and being almost virgin, keeping all riches of natural steppe herbs. In Stavropol territory there are large forests and bushes there a partridge, a pheasant, a pigeon, other wild birds live. In woods and steppes there live the squirrel, a hare, a fox, a badger, a raccoon dog, a wolf, a wild boar, there is a marten, a saiga, the roe, that is the fauna is various enough and is of interest for hunting.

Discussion

As consequence of climate dryness, in the territory the water network is less than in other regions of the North Caucasian federal district, it is presented by among 225 rivers flowing over its territory, the great amount of them are small rivers. Only Kuban, Terek, Kuma, Kalaus, Egorlyk are easily identifiable among the biggest rivers of the territory. However as a rule the rivers flow on a beauty spot where the unique local landscape is generated. The most part of 1800 water reservoirs, ponds, water basins has an artificial origin, the most part of the ponds are stocked with fish, that is are of interest for fishing.

Let's notice that lakes (more than 30), have a natural origin, and practically in half of them water and a dirt have the medical value, approved by local residents during tens years. Besides in many rural territories there are dissolved stocks both fine drinking, and mineral (medical) water which also make national wealth of rural territories, are potentially attractive not only to the future industrial working out, but also for today's application.

From the resulted short characteristic of natural-climatic potential it is clear that in the region there are rather good preconditions for rural territories multipurpose development organization, including rural population rehabilitation, and rural tourism, under condition of necessary infrastructure creation.

Let's consider these potential directions of rural territories multipurpose development.

Medical rehabilitation of rural population based on use of natural medical factors of rural territories, first of all medical dirt, a brine and mineral water. Stavropol Territory is rich with them, their deposits settle down not only around the Caucasian Mineral Waters, but also practically on all the territory. Such natural medical factors concerns a natural origin of lake, many of them have the name "Salty".

One of such lakes settles down on border of Trunovsky and Krasnogvardejsky municipal areas of Stavropol Territory (accordingly on border of Bezopasnensky and Medical Vezhensky rural settlements). The glory about medical properties of its dirt and a brine is well spread about the county, people from different regions, not only the local residents of Trunovsky area also next Krasnogvardejsky, Isobilnensky, New Aleksandrovsky and other areas of Stavropol Territory are likely to go to there for decades.

Spent at the initiative of Trunovsky area government and Pyatigorsk state institute of balneology and physiotherapy in 1989 research of medical dirt, brine and slush of the lake Salty have confirmed its high medical properties. On the basis of the conclusion which have

been given out by institute, in Bezopasnensky local hospital were released (unfortunately, in the extremely limited quantity because of insufficiency for this purpose bases on the given medical institution) medical procedures with the use of the dirt which has confirmed their productivity.

On the basis of this researches and the conclusion of the institute Trunovsky area government and Ministry of Health of Stavropol Territory of that period had been initiated the petition under the country leaders about a medical-sanatorium complex creation there. It has been rejected; absence in the country of financial resources on these purposes was the main cause of a failure from the Russian Ministry of Health.

Now necessity of the decision of this problem has got a special sharpness because of growth of chronic diseases of peripheral nervous system, chronic inflammatory diseases of female genitals, musculoskeletal system diseases, connecting tissue and supporting motor apparatus device of the population, that is just those diseases for which treatment a medical dirt is also used, the brine and the slush of the lake Salty (no less than other a similar origin lakes of Stavropol Territory).

Therefore search of financial possibilities of placing an inter-regional medical-improving complex should be again initiated in Trunovsky territory, typical rural area of Stavropol Territory. And this medical-rehabilitation establishment should become rural, using and developing advantages and possibilities of rural territory and rural tourism. Lake vicinities, basically presented by untouched steppe, give for this purpose unlimited possibilities. Besides territory of Trunovsky area – non-polluting with a unique steppe landscape and medical natural factors, possibilities for the organization of productive leisure, rural tourism, fishing, horse and pedestrian walks.

Besides medical and rehabilitation effects the potential social and economic effect is also looked through in case of the positive decision of the issue. Placing in this typically rural area with a high unemployment (more than 10 %, at the female population still above) a medical-improving complex leads to creation of additional workplaces of new profile for non-agricultural employment. It is rendering of service, having a rest and would become the important factor of unemployment decrease, improve the living standard. Replenishment of a profitable part of the local budget of area would become a consequence of it.

Understanding the necessity of decision designated above problems the Ministry of Agriculture of Stavropol Territory with a support of Trunovsky municipal area administration has worked out the investment an offer to place a medical-improving complex in the territory (MIC). The given work has been charged to the chair of the state and municipal management of the Stavropol state agrarian university.

The given task has been executed and the territorial binding has been made, also with specified its placing on a place by experts of Ltd. "Agro-industrial project". A decision of MIC placing on the present local hospital Bezopasnoe village territory was accepted. The area of the hospital and the ground areas adjoining to it (about 10 hectares) is in the municipal property, also has a flat character and is sufficient for creation of such medical-rehabilitation establishment, there are also basic engineering communications (except capital treatment facilities). The head of Bezopasnensky rural settlement (Davidov M. D) doesn't object to placing of the given object in the specified territory. Earlier considered plan of its placing in vicinities of lake Salty considerably would increase MIC's design cost (also including the

necessity of all system expensive engineering communications lining). However the question decision depends on the decision of financial questions of placing of this medical-improving complex that would become the beginning of rural territorial variety revival.

Simultaneously it is necessary to notice that in process of economic growth the increasing value for national economy is got by recreational sphere in which rural tourism should occupy the first place. Rural, or "green", tourism is rather young, but it is enough perspective direction of modern tourism development. Rural tourism very is a wide concept, the conventional definition to which isn't given yet. From the geo demographic point of view it is tourism outside of city line in territory with low population density. From the recreational product management point of view it is a set of various services from residing at the rural house, ecologic tours, adventure campaigns before direct participation in local agricultural population life.

As already mentioned, Stavropol Territory, having in the territory such health-tourist complex of cities as «Caucasian Mineral waters» district has good preconditions for the project realization. According to N. Efremenko principles of steady tourism: preservation of the environment, controllable use of technologies, social justice, and democracy, esthetic harmony finds an embodiment in rural tourism.

Agro tourism is already well popular in Europe after all the increasing number of people prefers patriarchal calmness, ecological cleanliness to vanity of modern luxurious world resorts. Apparently, there is a pot of gold which is capable to enrich the businessmen working in recreational sphere, and really to lead to Russian rural territories multipurpose development.

Rural tourism in Russia and including in Stavropol Territory can be realized both private businessmen, farmers, and any organizations (mainly agricultural profile), created and functioning on the legal base under the normative legal base.

Conclusion

We believe that the idea of rural tourism, especially in a close connection with improvement possibilities, is enough attractive to countrymen, and also the organizations of agrarian and recreational spheres of national economy and its agrarian regions. But its realization in many respects restrains the problems objectively existing in modern real life, especially in the conditions of crisis. First of all it is big quantity of norms and restrictions on enterprise activity existence with a wide spectrum of components, licensing, which creates a serious barrier to small business what in the great bulk should be rural tourism. Besides, it is a high level of nationalization in agrarian sphere and small relative density of the private sector presented in basic farmers and the personal part-time farms. The general low level of incomes of the Russian agricultural population doesn't allow making even initial investments into any business, and low level of incomes of potential domestic consumers in turn constrains enterprise initiatives. Abroad it is not generated as well corresponding image of Russia as tourist country that at all doesn't motivate demand for a tourist product among foreigners. The special place in this number of problems occupies backwardness of the rural infrastructure, accompanying service, comfort that frightens off potential clients.

However the accurate tendency of last years of the reference to natural values is conclusive advantage of Russia and, in particular, Stavropol Territory, after all much of what more civilized countries can dream only here remains. An environment is unique, far advances other tourist-focused countries, and with many regions ecology is better, there are fine monuments of ancient architecture and ethnography so it is possible to expect what exactly «growth points» of the local rural tourism developed in this place. Already now on Stavropol Territory lie various tourist routes: mountain, water, foot, bicycle, automobile. There are not only unique natural possibilities in the region, but also an extreme cultural-historical heritage. Stavropol Territory is a region of mountains, the healing waters, not lost live traditions. Stavropol Territory is recognized by the most perspective recreational region, as all-the-year-round (out-of-season) service is available for recreants. However the success of rural territories development direction depends on harmonious work of different society representatives: local population, bodies' state and local authorities, public organizations, tourist firms and the international organizations. Each of the listed subjects has the interest in rural tourism and plays the irreplaceable role. Only on this basis, in addition to natural, economic and organizational preconditions for rural tourism and medical rehabilitation the population providing rural territories multipurpose development of the region can be created.

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BUMBLEBEE COST-EFFECTIVENESS FOR SUNFLOWER POLLINATION IN ISOLATION CAGES

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Abstract

The lack of pollinators during sunflower seed production in isolation cages can lower the seed yield up to 90%. That is why we analyzed the cost-effectiveness of bumblebee usage as pollinators. Usual inbred line combinations for seed production were sown and efficiency of hand pollination was compared to open pollination and bumblebee pollination.

Bumblebees and honeybees were more efficient than hand pollination. Their constant presence during the whole flowering period led to better pollination conditions which reflected on increased seed yield. If pollination cost is compared per obtained kg of seed, than honeybees with 74 rsd/kg seem to be the best choice but not realistic because their colonies are too big for cages. Bumblebee colonies (694 rsd/kg) were as productive as open pollination but they were also twice as expensive in comparison to hand pollination (320 rsd/kg). Hand pollination impose as the best pollination method for sunflower under isolation cages, while in the cases when there is a lack of workers or the seed yield is of absolute importance bumblebees represent a good alternative.

Key words: *bumblebees, honeybees, isolation, pollination, sunflower*

Introduction

Sunflower is an open pollinated plant species originating from North America. After it was introduced to Europe in the XVI century, it was first used for ornamental porpoises and later recognized as an oil plant in Russia where the first sunflower cultivars were obtained at the end of the XIX century (Heiser, 1976). The main objective of

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breeding and obtaining cultivars was the increase of seed oil content. After the discovery of cytoplasmatic male sterility (CMS) the usage of heterosis and creation of hybrid sunflower was possible (Leclercq, 1969). Direct crosses of two or three inbred lines are used to produce a two- or three way sunflower hybrids. Large number of hybrids and therefore of inbred lines is needed because hybrids have narrow genetic base and different hybrids are needed for different agro ecological conditions (Škorić, 1988).

The need to create large number of sunflower hybrids and inbred lines directly increases pollination expenses because pollination is usually done manually in isolation cages. Although cultivated sunflower tolerates self-pollination quite good, in seed production under isolation cages the lack of pollinators can lead to a decrease in yield of up to 90% considering that CMS lines are involved (Špehar et al, 1986). That is why the usage of honeybees is recommended for seed production on larger areas in space isolation. That is both economically a good pollination method if the interest of honeybee growers is taken into consideration through bee hive renting, production of honey and increased sunflower yield.

The usage of isolation cages is frequent in breeding programs for selection and seed multiplication because the first stages of selection for new inbred lines is usually done with small number of plants. They cover relatively small area (30-50m²) which in combination with reduced air circulation and increased air temperature can lead to conditions that are not suitable for a newly formed honeybee colony with only a few thousand workers. That is why the pollination is usually done by hand which has its own advantages and disadvantages. The advantage of hand pollination is that if there comes to a mismatch of flowering period between the mother line and the line of father/fertility restorer, the workers can store the pollen on +4C° and keep it that way till the mother line starts flowering. The disadvantage of hand pollination is the possibility of uncontrolled crosses because the same workers are entering isolation cages with different hybrid combinations and the pollen can unintentionally be carried to another cage.

That is why a project was conceived with the aim to analyze the bumblebees cost effectiveness for pollination in isolation cages, because their colonies are more suitable by size for pollination in cages than honeybees.

Materials and methods

To test the effectiveness of several pollination methods a trial was planned with combinations of inbred lines that are usually sown in the cages for seed production. The sown material included mother lines in sterile (CMS) and fertile form (B analogues) and fertility restorers for three commercial sunflower hybrids: Rimi (cages 1 and 2), NS-H-2023 (cages 3 and 4) and NS-H-2026 (cages 5 and 6). Each cage covered area of 48 square meters in which there were sown eight rows with 50 plants per row. Plants were irrigated using drip irrigation system.

Two middle rows were fertile inbred lines and the rest were sterile. Two cross combinations were sown per hybrid to determine if there were any differences in

the time needed for pollination of all the inflorescences in the mother line. The first combination included CMS line and a B analogue and the other a CMS line and a fertility restorer. Sowing time was planned for each genotype so that the flowering period is approximately the same.

The cages were used to compare the efficiency of hand- and bumblebee pollination. Out of the cages open pollination was used as a control. Normally present insects were found during flowering period in open pollination and honeybees made more than 75% of them. Honeybees were not brought to the trial on purpose, but their presence was assured by the proximity of local honeybee keepers who in the same period had about 30 hives in less than 2 km from the trial. Bumblebee hives were brought in to the cages as ready hives with about 80 workers (Koppert – Natupol N hives). Seed yield was weighed on five inflorescences per cross combination and used as a base to calculate the total yield of 300 sterile mother plants. The time that workers spent in the cages was noted separately for every entry.

Results and discussion

Restorer lines (Rha-168, Rha-ses and Rha-ses-imi) are branched and they flower longer (in this trial 19-24 days) than CMS lines (HA-98-A, OCMS-74-A and HA-26-imi-A, 10-15 days). To make sure that flowering periods overlap, and because of shorter vegetative phase, CMS lines were sown 25 days after the restorer lines. Flowering periods overlapped in all six cages so that the bumblebees could transfer pollen and perform the pollination. The peak of flowering (75%) for all lines in open pollination occurred during the flowering period of isolated plants except for the line HA-98-A which flowered earlier than in the cage 2 (Table 1.). Longer flowering period of fertility restorers (Rha) in comparison to the mother lines (A and B) led to earlier sowing of sterile mother lines in cages 2, 4 and 6 (Table 1.).

Workers entered the cages six to ten times to perform the pollination and on average they spent inside 1,24 h or 75 minutes (Table 2.). Periods in which the workers performed pollination were almost twice as short than the periods which bumblebees had available for pollination if total pollination is analyzed in days (Table 2.).

Table 1. Sowing date, flowering duration in cages and the date when 75% of inflorescences flowered in open pollination for sown genotypes

Cage number:	Genotype	Sowing date	Flowering period in cages			Date of 75% flowering in open pollination
			Start	End	Duration (days)	
1.	HA-98-A	15.4.	2.7.	16.7.	14	10.7.
	HA-98-B	15.4.	2.7.	16.7.	14	10.7.
2.	HA-98-A	10.5.	18.7.	30.7.	12	13.7.
	Rha-168	15.4.	8.7.	2.8.	24	10.7.
3.	OCMS-74-A	15.4.	2.7.	14.7.	12	9.7.
	OCMS-74-B	15.4.	2.7.	14.7.	12	9.7.
4.	OCMS-74-A	10.5.	14.7.	29.7.	15	16.7.
	Rha-ses	15.4.	13.7.	3.8.	20	15.7.
5.	HA-26-imi-A	15.4.	2.7.	16.7.	14	9.7.
	HA-26-imi-B	15.4.	2.7.	16.7.	14	9.7.
6.	HA-26-imi-A	10.5.	19.7.	29.7.	10	21.7.
	Rha-ses-imi	15.4.	13.7.	2.8.	19	16.7.

Table 2. Periods in which the pollination was performed and the entry frequency of workers to cages

Cage number:	Hand pollination					Bumblebee pollination		
	Number of entries to cages	Total work hours in the cages (h)	Pollination start	Pollination end	Pollination duration (days)	Hive placed in the cage	Hive removed	Pollination duration (days)
1.	9	10	3.7.	16.7.	13	28.6.	26.7.	28
2.	9	14,5	14.7.	3.8.	19	4.7.	13.8.	39
3.	10	12	30.6.	16.7.	16	28.6.	26.7.	28
4.	10	11,8	14.7.	2.8.	18	4.7.	13.8.	39
5.	6	6,5	9.7.	17.7.	8	28.6.	26.7.	28
6.	8	8,9	14.7.	3.8.	19	4.7.	13.8.	28

For increased efficiency, workers first enter the isolation cages only when 10-20% of plants have started flowering, or in other words, when there is enough pollen produced on the fertile analogue (B) for pollination. Likewise, they end the pollination before all plants finish flowering because the seeds from the central part of the inflorescence are smaller than the ones from the periphery and combined with lower

number, have somewhat smaller impact on yield. Hand pollination can basically be derived to two visits of workers to the same inflorescence because of gradual flowering. In that way the pollen is applied on over 75% of inflorescence surface. First bumblebee hives were put in to the cages 1, 3 and 5 on the beginning of flowering on June 28th while the rest of the hives were fed with pollen till they were placed in the remaining cages on July 4th (Table 2.). Hives were placed in the cages on the beginning of flowering and removed after the last branches on fertility restorers finished flowering. That is why the number of days in which bumblebees performed pollination was 28 to 39 (Table 2.). That is not really needed because the sterile mother lines finished flowering after about 14 days. Having in mind that the working life of one bumblebee colony type Natupol N is about 8 weeks, one hive could be used in at least two cages with a pause in between in which the bumblebees would spend their pollen reserves from the previous cage.

To determine the cost effectiveness of various pollination methods, we first ascertained the cost per cage surface, and than by kilogram of obtained seed. Bumblebee hives type Natupol N are available from Kopert on the Serbian market at the price of 6.600 rsd each (Price confirmed on July 21st 2010). Because of constant fluctuation and differences in salaries in various companies, the salary of the worker performing pollination was presented as average gross income in the Republic of Serbia for May 2010. According to the Statistical office of the republic of Serbia it was 46.454 rsd (RSO, internet source). When honeybees are used on sunflower fields for pollination it is advised to place two to three hives per hectare (Anfinrud et. al, 1997) and according to the Serbian federation of beekeeping organizations (SFBO) the compensation per hive is approximately 630 rsd for the year 2010. and it is meant for the service of pollination in one locality during 15 to 20 days (SFBO, internet source).

Workers spent in the cages a total of 63,7 working hours while pollinating which is 8 working days. When calculated in rsd, the cost of hand pollination for all six cages was 16.900 rsd. For bumblebee pollination the cost of hive acquisition was 6×6.600 rsd which is in total 39.600 rsd. Honeybees were used in the trial as another pollinating method for comparison even though the crosses they made were performed in open pollination. In that case, pollen from other sunflower lines and hybrids was also present and it's availability probably increased overall seed yield. If we assumed that an ideal quantity of honeybees is 2,5 hives per hectare than a hypothetical cost for pollination of six cages (48m² each) would be $6 \times 0,0048\text{ha} \times 2,5 \text{ hives} \times 630$ rsd which is in total 45,6 rsd. However, one can not place less than one hive per cage and the compensation for those hives would be far greater because of high honeybee mortality due to cramped space. The calculation including honeybee mortality leads to a figure starting at 6000 rsd for six cages.

When efficiency is analysed a conclusion can be made that pollination by bumblebees and honeybees were better than hand pollination. Their constant presence during whole flowering period directly led to better pollination conditions which reflected on seed yield. If the pollination cost is divided with obtained yield a clear comparison of cost effectiveness for the three used pollination methods can be made (Tables 3. and 4.).

Table 3. Sunflower seed yield on sterile lines and a pollination cost calculation per obtained kilogram of seed

Cage number:	Cross combination	Bumble bees	Hand		Bumble bees	Hand
		(Kg)*			(rsd./kg)	
1.	HA-98-A	5,62	10,89		1174,3	242,4
	HA-98-B					
2.	HA-98-A	9,20	7,79		717,4	491,3
	Rha-168					
3.	OCMS-74-A	9,69	9,37		681,1	338,0
	OCMS-74-B					
4.	OCMS-74-A	13,69	11,64		482,1	267,6
	Rha-ses					
5.	HA-26-imi-A	9,98	5,11		661,3	335,7
	HA-26-imi-B					
6.	HA-26-imi-A	14,74	9,72		447,8	241,7
	Rha-ses-imi					
	Average	10,49	9,09		694,0	319,5

* Least significant difference (LSD) for seed yield at 0,05 level = 1,93 kg

Table 4. Sunflower seed yield on sterile lines and a pollination cost calculation per obtained kilogram of seed

CMS line	Yield (Kg)*	Pollination cost with one hive per cage (rsd./kg)	Pollination cost for honeybees out of the cages (rsd./kg)
HA-98-A	10,81	92,5	0,7
OCMS-74-A	15,40	64,9	0,5
HA-26-imi-A	15,40	64,9	0,5
Average	13,87	74,1	0,6

*LSD for seed yield at 0,05 level = 1,93 kg

Large seed yield difference between specific cross combinations like HA-26-imi-A x HA-26-imi-B could not be only a result of higher bumblebee efficiency in comparison to hand pollination (Table 3.), but also a result of open pollination where the sterile mother lines were available for crossing with other present fertile genotypes and insects (Table 4).

Even though honeybees seem to be the best choice they are not a realistic one because their colonies are far too big for such small cages. Bumblebee colonies fitted the size of the used cages and provided seed yield that is significantly higher than from hand pollination and on the level with open pollination (Tables 3. and 4.). Bumblebees in comparison to honeybees start foraging on lower temperatures, their working hours are 50% longer and they finish a flower in shorter time (Corbet et al. 1993). Limiting

factor for bumblebee usage is the buying price which could be lowered two to three times indirectly through better seed production planning. By reusing the same colony in two cages, buying price would be similar to the cost of hand pollination.

Hand pollination imposes it self as the best of the three studied pollination methods for sunflower under isolation cages. Although in circumstances of worker shortage, exclusion of the possibility for uncontrolled crosses or the necessity of high seed yield, bumblebees are a good alternative.

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THE IMPACT OF SOWING STRUCTURE ON PROFITABILITY OF FAMILY FARMS DIRECTED AT THE FINAL PRODUCTION OF FATTENED BEEF CATTLE¹

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Abstract

Small and inadequately used estates of family farms limit the capacities of cattle production because of limited forage production which is the basis of farm economic sustainability. Insufficient and inadequate use of soil resources leads to the decrease of their competitiveness which also results in the need of finding more rational ways of their organisation.

Bearing that in mind, the decision on buying mercantile maize on the market instead of producing it on the farm is taken into consideration. As a consequence of the previous decision, the possibility of the change of sowing structure is raised.

Applying partial budget analysis, it was examined whether the decision on buying mercantile maize on the market and changing the sowing structure was economically justified and under what conditions using additional procedure of sensitive analysis. Applying this approach, it was investigated to what extent that decision contributed to improving the profitability of family farm.

The results of the conducted research show that buying mercantile maize on the market will enable changes in the sowing structure, that is, buying mercantile maize will make the area free, which according to some conservative estimations, can be used for production of sufficient amounts of alfalfa hay and silage maize for fattening of additional 19 head. In addition, it is shown that more rational way of organising family farms directed at the final production of fattened beef cattle can additionally use available resources and in that way increase profitability and improve competitiveness.

Key words: *economic analysis, profitability, competitiveness, sowing structure, mercantile maize, beef cattle fattening, family farms.*

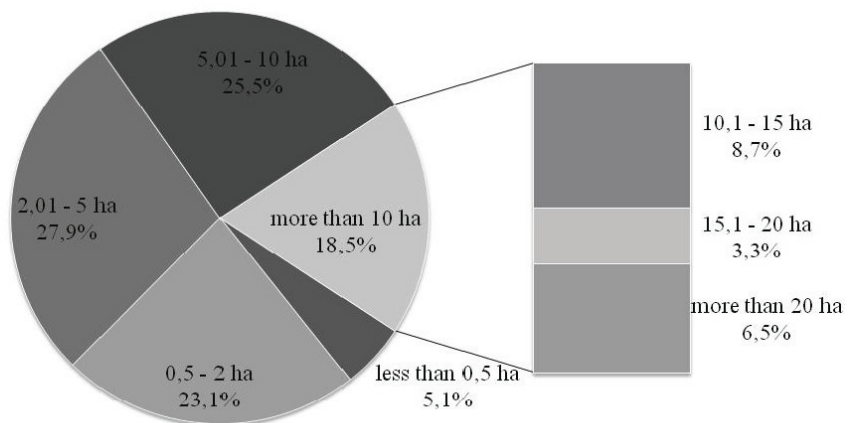
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Introduction

Animal husbandry as an initiator of the development of the total agricultural production faces a serious crisis. The contribution of animal husbandry to the total agricultural production of the Republic of Serbia is estimated at about 40%, whereas in the 1970s the participation of animal husbandry in the structure of agricultural production was 50%. On the other hand, the participation amounts to 70% in the developed countries (Lučić et al., 2001). Keeping natural conditions, unused facilities and other potentials in mind, it is necessary to systematically increase the number of head (especially those breeds whose products are deficient on the market – beef) and change breed structure and in that way to influence productivity and profitability of total production. Regarding researches which show that average share of livestock in the Republic of Serbia is of low intensity (28 livestock unit per 100 ha), in which process the share of livestock by districts ranges from very weak (15 livestock units per 100 ha in South Bačka District) to low intensity (47 livestock units per 100 ha in Kolubara District), except for Mačva District, which has a medium level of livestock share (58 livestock units per 100 ha) which refers to significant reserves for intensifying agricultural production by establishing favourable relationships between animal husbandry and plant production (Bošnjak and Rodić, 2008). The fact that animal husbandry is slowly renewable should be taken into account, as well as the fact that family farms, weakly organised, participate in the structure of livestock fund with 76% (Bošnjak et al., 2008). Bearing that in mind, the problem of unfavourable ownership structure of family farms is raised (Graph 1).

Graph 1 - Ownership structure of registered agricultural households on the territory of AP of Vojvodina in year of 2008.



Source: Author's calculation based on data from Ministry of Finance of Republic of Serbia - Treasury (06.05.2008.)

In the structure of registered agricultural households on the territory of AP of Vojvodina in observed period, small farms are predominant – farms with land property below 5 ha make 56% of total number of registered farms, whereas the share of farms with land property of over 10 ha is 18.5%. This is extremely unfavourable ownership structure considering that these are farms located in low land region. Unfavourable ownership structure is general problem present at the level of Republic of Serbia. According to research results obtained by Bogdanov Natalija and Božić Dragica (2005) in ownership structure of farms in the Republic of Serbia, predominant are small farms, since small farms with below 3 ha of land make 60.2%, whereas farms with over 10 ha make only 5.6% of total number of farms³. Considering the decisive significance of ownership structure for efficiency of operation in agriculture, it can be concluded that it is very difficult to remain competitive and survive on the market with conditions of increasingly strong competition with such unfavourable ownership structure. Small and inadequately used estates limit capacities of livestock production because of reduced forage, which represents the basis of economic sustainability of the farm. An insufficient use of their production potentials leads to the decrease of their economic efficiency and rationality of business operations, which makes them less competitive. All that refers to the need for finding modern and more rational ways of their organisation so that available resources can be additionally used. In addition to this, it is necessary to coordinate production structure with available possibilities in order to achieve good economic results (Bastajić and Živković, 2002). In the time of increasingly profitable production, the special attention should be called to the choice of optimal sowing structure, regarding the great impact it has on functioning and success of family farms business operations (Todorović and Munćan, 2009). Considering that, the aim of this paper is to examine the impact of sowing structure on their profitability using the model of family farm directed at the final production of fattened beef cattle under the conditions of unchanged estate size.

Materials and Methods

In accordance with the aim of the research, and on the basis of data collected on the selected family farms during the year of 2009, the model of family farm is constructed, having the following characteristics:

- family farm is placed in lowlands,
- it is directed at the final production of fattened beef cattle of Simmental breed (intensive fattening of calves weighing 150 kg at the beginning, achieving total mass of 550 kg, averagely realised one cycle per year, 25 head in fattening),
- the structure of plant production is coordinated with the needs of animal husbandry and agrotechnical limitations of crop rotation,

³ According to Census 2002, number of agricultural farms in Republic of Serbia was 778.891.

- the technology of crop production is typical for the area where the family farm is located and
- required area for the production of animal feed, aimed at providing stable supply, was increased by 3% to 7%, which is in accordance with practical recommendations (Krstić et al., 2000).

For the purpose of finding modern and more rational ways of their organising as well as for the purpose of additional using of available resources, the decision on buying mercantile maize on the market instead of producing it on the farm is taken into consideration. In addition, the fact that buying mercantile maize on the market instead of its producing on the farm makes the area free for potential production of additional amounts of alfalfa hay and silage maize for fattening of additional head should be taken into account. In that sense, the decision on buying of mercantile maize on the market instead of producing it on the farm influences the change of sowing structure.

Applying partial budget analysis, it was examined whether the decision on buying mercantile maize and changing the sowing structure was economically justified and under what conditions using additional procedure of sensitive analysis. Applying this approach, it was investigated to what extent that decision contributed to improving the profitability of family farm.

Results and Discussion

Buying mercantile maize on the market instead of producing it on the farm makes changes in sowing structure which result in the increasing the areas occupied by alfalfa and silage maize (Table 1.).

Table 1. – The area of crops and sowing structure before and after taking a decision on buying mercantile maize on the market instead of producing it on the farm

CROP	AREA (ha)		CHANGE (ha)	CHANGE (%)	STRUCTURE (%)	
	Before	After			Before	After
Alfalfa (establishing)	0.39	0.69	0.30	78.72	2.57	4.59
Alfalfa (using)	1.44	2.58	1.14	78.72	9.63	17.20
Maize (mercantile)	3.71	0.00	-3.71	-100.00	24.75	0.00
Maize (silage)	2.89	5.16	2.27	78.72	19.25	34.41
Other crops	6.57	6.57	0.00	0.00	43.80	43.80
TOTAL	15.00	15.00			100.00	100.00

Source: Author's calculation

Estimated annual change which amounts to -40,270.3 dinars shows that, according to previously mentioned assumptions, buying mercantile maize is not economically justified, for it unfavourably influences the business operations of family farms (Table 2.).

Table 2. - Partial Budget Analysis of Buying Mercantile Maize Instead of Producing Mercantile Maize (RSD)

ELEMENTS	Number of Added Calf's	
	0	19
Increased Revenue	0	1,862,000
Adding calf's to herd	0	1,862,000
Reduced Expense	193,617.2	193,617.2
Stop harvesting mercantile maize	193,617.2	193,617.2
Total Increased Revenue and Reduced Expenses	193,617.2	2,055,617.2
Reduced Revenue	0	0
None	0	0
Increased Expense	233,887.5	1,629,132.1
Adding calf's to herd	0	1,217,490.1
Purchasing mercantile maize	233,887.5	411,642
Total Reduced Revenue and Increased Expense	233,887.5	1,629,132.1
Estimated Annual Change	-40,270.3	426,485.1

Source: Author's calculation

However, if we take into account the fact that buying mercantile maize in the actual example will make the area free, which according to some conservative estimations, can be used for production of sufficient amount of alfalfa and silage maize for fattening of additional 19 head then the situation seems quite different (Table 2.). In that case it can be expected that average annual change of the results of family farms amounts to 426,485.1 dinars.

In order to examine the sensitivity of that decision, partial budget analysis (Table 2.) is done for the different number of head added to fattening and different amounts of purchasing prices of mercantile maize (Table 3.).

Table 3. - Estimated Annual Change if Mercantile Maize is Purchased Given Varying Numbers of Calf's Added and Purchased Mercantile Maize Prices

N° of Added Calf's	Purchased Mercantile Maize Price (RSD/Ton)						
	6,000.0	7,500.0	9,000.0	10,500.0	12,000.0	13,500.0	15,000.0
0	37,692.2	-1,289.1	-40,270.3	-79,251.6	-118,232.8	-157,214.1	-196,195.3
5	176,115.1	129,337.6	82,560.1	35,782.6	-10,994.9	-57,772.4	-104,549.9
10	314,537.9	259,964.2	205,390.4	150,816.7	96,242.9	41,669.2	-12,904.6
19	563,699.1	495,092.1	426,485.1	357,878.1	289,271.1	220,664.1	152,057.1

Source: Author's calculation

In case no head is added to fattening, the decision on buying mercantile maize is not economically justified as long as purchasing price of mercantile maize is higher than 7,450.4 dinars per tonne. However, adding of 5 head to fattening positively influences business results provided that purchasing price of mercantile maize is lower than 11,647.4 dinars per tonne. On the other hand, the decision on buying mercantile maize by adding maximum possible 19 head to fattening is economically justified

for analysed range of prices of mercantile maize. Thus, lower purchasing price of mercantile maize and greater number of head added to fattening result in the changes that positively influence business results of family farm.

Although it is determined under what conditions that decision are economically justified, the final conclusion cannot be reached without an additional analysis. Apart from previously described factors, there is a range of others, which producers should consider when making decisions on shifting to buying mercantile maize.

Are sufficient amounts available on the market every year? What is the quality? Are there possibilities for storing mercantile grain maize which will be purchased on the market? Is soil used for production of mercantile maize suitable for growing of other crops? Is it possible to use the work employed for production of mercantile maize in any other way? Is it possible to use facilities for storing mercantile maize ear for some other purposes?

There are other questions concerning investments which should be considered. What is the degree of using available capacities for fattening and whether adding of envisaged number of head requires new investments? Is there any available capital for buying additional head? Will the equipment which is used only in the production of mercantile maize (e.g. maize picker) be sold? The question whether the equipment will be sold or not greatly influences economic justification of previously analysed decisions, because in case the equipment is not sold, its fixed costs remain, which encumbers the business operations of family farm. However, it is not true in the case when the same equipment is used for doing a service to others.

Conclusion

The results of the conducted research show that it is the consequence of the fact that buying mercantile maize on the market will enable changes in the structure of sowing, that is, buying mercantile maize will make the area free, which according to some conservative estimations, can be used for production of sufficient amounts of alfalfa and silage maize for fattening of additional 19 head. However, the results of conducted research show that the decision on buying mercantile maize is not economically justified as long as its purchasing price is higher than 7,450.4 dinars per tonne. On the other hand, buying mercantile maize along with simultaneous increasing of the number of head fattened positively influence business results. Hence, lower purchasing price of mercantile maize and higher number of head added to fattening result in changes which positively influence business results of family farm.

The results of this research should be considered in the context of aspiration to establish profitable specialised family farms in Republic of Serbia. In addition, it is shown that using modern and more rational way of their organisation the additional resources can be used, and in that way improve their profitability and competitiveness.

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POTENTIALS OF MOUNTAINOUS REGION OF SERBIA FOR MAP SECTOR DEVELOPMENT

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Abstract

Apart from mineral raw material and energetic resources, soil quality, relief characteristics and hydro-potentials, natural resources also comprises for landscape characteristics as well as geographic position and biological diversity. Medicinal and aromatic plants (MAP) as a resource, is a component of the natural environment that may play an important role in structuring of spatial, social and economic rural areas that belong to mountainous region of Republic of Serbia. These areas are blessed with numerous resources (climate, soil, biodiversity, labour, etc) that are prerequisite for development of MAP sector; although they are not adequately utilised. Territory of Serbia, as a part of Balkan Peninsula, is one of the most important biodiversity centres and medicinal plants belong to economically the most significant ones in its flora. MAP sector encompasses production processing units, competent personnel as well as institutions that may support it and improve business on domestic market. MAP business is linked to certain regions of the country where the purchase is well organized: in the South-East part of Serbia collection of MAP has a long tradition, while in Vojvodina – there is a large-scale MAP production. General recommendations are: to increase surfaces under wild MAP collection within collection areas and to introduce large-scale MAP production in mountainous regions of Serbia. At the moment, there is no good concept of sustainable collection, processing and marketing in the MAP sector of Serbia.

Key words: MAP, resources, mountainous region, market potentials, MAP sector.

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Introduction

Serbia is situated on Balkan Peninsula, encompassing territory from Pannonia lowland on the north to the south-Balkan high mountains that belong to Dinaric and Shara-Pindic system on the South, encompassing 88766 km of soil surface. Geographic position of Serbia is very specific and it is characterized by geo-morphological, geological and pedological diversity and influenced by different climates that altogether brought about richness in genetic, species, and ecosystem diversity, making Serbia one of the most important biodiversity centres on Balkan Peninsula. In Serbian flora, medicinal plants become economically very important. With ca. 700 plant species that possess medicinal characteristics, it is obvious that this region represents an important medicinal and aromatic plants (MAP) biodiversity centre. Ca. 400 MAP species is in use and ca. 250 is in regular turn-over. The structure of turn-over of MAP species depends on their presence in each particular region of the country. In the mountainous region of Serbia a huge number of MAP species grows spontaneously and there is an interest for organized MAP purchase. Market demands dictates structure and quantity of demanded MAP species (whether collected from the wild or cultivated), as well as their price. The local market is also influenced by specific MAP demands on the World market. Since Serbia has very long tradition as a MAP exporter, there is no doubt that we have to increase quantities of MAP plant material and this can be accomplished by extending surfaces under MAP species (both, wild collected and cultivated), to some other regions of the country, especially in mountainous one.

Resources of significance for MAP sector in Serbia

The word “resource” derives from French word *ressource* (source) and represents a source of material power that provides raw material important for economy and that is used as a source of income and profit. Natural resources, as a component of the nature, may significantly influence formation of spatial, social and economic structure. Apart from mineral raw material and energetic resources, soil quality, relief characteristics and hydro-potentials, natural resources also comprises for landscape characteristics as well as geographic position and biological diversity. Republic of Serbia holds numerous resources (climate, soil, labour, biodiversity, etc), prerequisite for MAP sector development. Significant soil potential of 5093000 ha of entire agricultural land, 5056000 ha represent arable land, 3602000 ha is cultivated (64,8% plowed fields and gardens, 4,7% orchards 1,1% vineyards, 12,2% meadows and 16,4% pastures).

Meadows and pastures are natural habitats for a great number of MAP species and a potential source of MAP raw material. According to some estimates, ca. 5000 ha in Serbia is covered by different wild MAP species. Surfaces under cultivated MAP were always planned as to not exceed 15000 ha, in order to avoid making surplus of MAP raw material. Data on surfaces under MAP in Serbia differs significantly, depending on the source of information. Surface under MAP cultivation in Serbia stands for ca.

1% of arable land and it is almost not worth mentioning in comparison to some other crops that are traditionally grown in the country. MAP production is mainly present on individual farms and it is mainly organized on small parcels, what is a general characteristic of MAP sector in Serbia. For cultivation of some MAP species, a lot of manpower has to be engaged, what makes this kind of production more expensive. On the other hand, private sector is the one that possesses manpower and therefore is capable to keep these people employed. Thus, MAP seems to be a good solution for small agricultural ownerships. Intensive MAP cultures may provide income and profit for small, family ownerships in field of primary MAP production as well as for bigger estates, specialised in MAP processing and export trade.

Labour force accompanied with human capital are resources that are very important for each community and it is one of the key factors in development of agro-economy and the entire national economy. Following the famous “land reform” that was carried out in Serbia in 1991, the land reserves of some households have significantly increased. There is a great number of farmers that express their interest to replace some traditionally grown crops and to try to introduce some new crops in the culture. MAP production might be a good choice for this, especially for private ownerships of rural mountainous areas of Serbia. The main limitation in the fast development of this activity in rural areas is relatively small number of vital individual farms, especially in the high-mountain villages. In sparse households of mountain villages mainly live older people while the younger ones have insufficient knowledge on medicinal plants or they are not enough interested in this activity.

Presented economic situation in the recent years caused variability of the number and structure of MAP pickers and producers, since it depended on seasonal job offers and market demands for medicinal plants. In MAP sector, pickers are usually unemployed people or employed individuals whose main job does not provide essential existence.

During 1990-ies, due to numerous economical difficulties, political turbulence and war circumstances, drastic decrease in average fertilizers consumption has occurred. Use of chemicals in agricultural production is still prerequisite for achievement of certain economic results. On the other hand, controlled production, according to GAP standards, with a minimal or without the application of mineral fertilizers, we can use as a great opportunity to start producing healthy and safe MAP row material.

Perspectives of MAP sector in the mountain region of Serbia

According to estimates, there are ca. 4000 organized LAB picker - families in Serbia, what accounts for ca. 12000 MAP pickers. Besides, there are also periodical pickers whose activity has a lower economical significance and they are participating in cases of an increased MAP demand or when prices for collected plants are higher than usually. There are also pickers in rural and urban regions that collect MAP for their own use or for a direct sale on green markets. How many pickers are there in the last two picker-categories is difficult to estimate. Due to present unemployment, so characteristic for period of transition that our country is undergoing through, great number of households

needs some extra incomes that might be provided by some additional activities, such as collecting MAP from the nature. This job can provide economic survival of poor families. Open conversation with several MAP enterprise owners reveal that daily wages for worker in large-scale production of MAP range from 10 to 20 €, while pickers of wild growing MAPs can earn from 20 to 50 € per day, for dry MAP row material. Some enterprises organize picking of MAP and pay per kilogram of freshly picked MAPs, where skilled pickers may earn even 50 € per day.

Collection of MAP and forest fruits from the wild is an integral part of activity of many village households, especially in hilly-mountainous region of South-East Serbia, and this is the most available form of activity of MAP sector. South-East Serbia (communities: Svrljig, Knjaževac, Sokobanja, Boljevac, Aleksinac, Gadžin Han, Pirot, Surdulica, etc) has differentiated itself as a part of the country that is engaged in purchase and primary processing of MAPs and some enterprises also specialized for herbal tea production. Initiator of all activities regarding MAP in that region was Slovenian enterprise “Kirka” that has constructed its production unit in Svrljig. Now, many enterprises operate in this region: “Plantamel”, “Jeligor” and “Iris” in Svrljig, “Sanicula” in Gornja Mutnica close to Paraćin, “Betula” in Žitkovac close to Aleksinac, “Adonis” in Sokobanja, “Srbija-šume” in Knjaževac and Boljevac. In the central part of Serbia, it is worth to mention “Tilija” from Čačak, “Malina-impex” from Valjevo, “Drina Pak” from Ljubovija, etc. Enterprises from central and western parts of Serbia did not manage to develop organized purchase nor MAP cultivation, so they acquire MAP row material from other enterprises. Number of enterprises operating in MAP sector is far bigger and the activity in which they are engaged in and localities where they are settled cover the entire country. They are potential actors in extending the areal of MAP cultivation and wild collection. Special attention should be focused on expanding surfaces under cultivated MAPs in hilly-mountainous region of the country in order to provide more economic supplies of other regions in Serbia with god quality MAP row material.

Table 1. Plant species that might be collected from the mountainous region of Serbia

Plant species	Drug	Price (RSD)
<i>Angelika archangelica</i>	radix	300
<i>Rubus fruticosus</i>	folium	100
<i>Sambucus nigra</i>	flos	450
<i>Tillia sp.</i>	flos	450
<i>Tussilago farfara</i>	folium	210
<i>Urtica dioica</i>	folium, radix	105
<i>Vaccinium myrtillus</i>	herba	100
<i>Viscum album</i>	herba	100
<i>Rosa canina</i>	fructus	110
<i>Quercus sp.</i>	cortex	100
<i>Primula officinalis</i>	radix	400

<i>Ononis spinosda</i>	radix	180
<i>Juniperis comunis</i>	fructus	80
<i>Inula helenium</i>	radix	160
<i>Equisetum arvense</i>	herba	100
<i>Crataegus monogyna</i>	flos	105
<i>Centaurium umbellatum</i>	herba	140
<i>Betula pendula</i>	folium	100
<i>Arctium lappa</i>	folium /radix	90/180
<i>Agrimonia eupatoria</i>	herba	80
<i>Artemisia absinthium</i>	herba	90
<i>Teucrium chamedrys</i>	herba	100
<i>Teucrium montanum</i>	herba	135
<i>Taraxacum officinale</i>	folium/radix	150/300
<i>Melissa officinalis</i>	herba	100
<i>Thymus serpyllum</i>	herba	130
<i>Origanum vulgare</i>	herba	95
<i>Satureja montana</i>	herba	140
<i>Hypericum perforatum</i>	herba	95
<i>Achillea millefolium</i>	herba	95
<i>Plantago lanceolata</i>	folium	100
<i>Valeriana officinalis</i>	radix	250

Information source: pricelist form IMPR „Dr Josif Pančić”

Serbia possesses resources in the mountain regions that are still unexploited regarding natural, production and market possibilities of its MAP sector. Organised purchase of MAP in wider region of the country as well as expanded large-scale MAP cultivation in this region greater quantities of MAP row material might be achieved what would result in increase of MAP export. Reachable aims are final products with defined origin. Organic model of MAP production (collection and cultivation) has to be emphasised. Volume of the purchase and processing of organic MAPs depends on yields that fluctuate. Since organic MAPs represent “first-class” products, very demanded on foreign market, essential preconditions, such as continuity in the offer and quality must have been satisfied, in order to provide solid and permanent incomes for the labour.

Excessive *in situ* MAP exploitation represents a great danger for natural resources in Serbia. It is important to preserve MAP biodiversity. Correct estimates of natural resources and degree of biodiversity endanger, facilitate discovery of the proper approach as how to appease gap between profit and MAP sector development that respect biodiversity. In order to develop MAP sector, collaboration on MAP conservation throughout education of pickers about correct picking and cultivating techniques as well as on providing financial support to stimulate new primary MAP producers and encourage pickers to start producing plants that might be produced. During education, pickers and producers should be warned on possible consequences caused by biodiversity loss and

reminded on significance of biodiversity for entire community.

Exaggerated exploitation of MAPs in Serbia could jeopardize biodiversity. Increased demand for MAPs boost threat of excessive picking from the nature, thus the amounts of collected MAPs should be increased with appropriate measure. Present organizations of MAP pickers should be reinforced in such a manner to be able to actively contribute to determination of MAP quotas, since the current ones are still very restrictive toward this sector. Standard in collecting and cultivating of MAPs should be introduced, as well as organic MAP production, since it represents a great chance for gaining added value of product that certainly should be used.

Cultivation of MAPs in satisfying agro-ecological conditions of mountainous regions, that can provide achievement of high yields and suitable amount of biologically active principles certainly has priority over collection of plant material from their natural stands, due to a several reasons: rational utilisation of agricultural soil resources inappropriate for other crops; keeps many people employed; achieves better economic effects in comparison to cultivation of traditionally grown crops; preserves Serbian gene-fond (rare, endemic and threatened medicinal, plant species are preserved and protected from disappearance).

Conclusion

Serbia needs a solid concept of sustainable MAPs collection and cultivation. Therefore, efforts should be directed towards more effective promotion of the entire MAP sector. Sustainability is essential for: biodiversity conservation (the ambient one), security of permanent and safe incomes and decrease of poverty in rural environments (the social one) as well as for providing economic value for society (the economic one). Increase in awareness on importance of biodiversity conservation, achieved throughout continuity of ecological education and trainings for local citizens on picking and cultivating of MAPs along with a better marketing concept for MAP sector, this activity could be expanded on each rural region of Serbia, especially in mountainous regions that are, in that sense, the most jeopardized ones.

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SPECIFICITIES OF “UZICKA” SAUSAGE PRODUCED IN TRADITIONAL WAY OF MANUFACTURE

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Summary

This paper investigates traditional way of production of “uzicka” sausage manufactured in household Kacer situated at Zlatibor Mountain. Investigated parameters were climatic (relative humidity, temperature and air circulation) during production process – smoking, drying and ripening (fermentation) of the sausage, as well as overall acceptability of the final product. The results have shown the direct influence of geographic location, altitude, temperature, wind direction and strength and epiphytic micro flora from the raw material, on the ripening process and quality of the final product. Specific weather conditions that can be measured during production process can vary significantly throughout the years, which is the main reason for non-standardized quality typical for traditionally manufactured products. At the end of the production, samples of “uzicka” sausage taken from all three fermentations were evaluated with high grades during sensory analysis. However, it is also concluded that sensory and quality parameters are largely dependent on microclimatic conditions during the production process.

Key words: *microclimatic conditions of ripening, traditional production, "uzicka" sausage*

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Introduction

Traditionally fermented meat products originating from specific areas are characterized by distinctive sensory properties and, in most cases, excellent quality. These attributes are largely influenced by climatic conditions of the production site, especially if microclimatic conditions are area-specific (*Radovanović et al, 2005, Rašeta et al, 2010*). Production of fermented sausages is one of meat-processing areas that occupy interests of scientists in the last several decades. Increase of competitiveness and liberalization of the global market resulted in focusing of meat and other food industries on higher productivity and profit increase (*Zlender, 2004*). From the other side, increased consumption of fermented meat products due to their recognizable and desirable sensory properties raised the issue of intensifying their production.

Research carried out in our country provided numerous data on optimal raw-material composition, used spices and food additives, possibilities of application of starter cultures and semi-purified bacteriocins, as well as novel technological procedures in manufacturing of traditionally fermented meat products (*Veskovic-Moracanic, 2007*). Microflora of fermented sausages has great importance for biochemical processes that take place in sausages during their fermentation. Since the lactic fermentation process during traditional production is spontaneous, uncontrolled and based on the activity of epiphytic microflora, the quality of such products is erratic and often the sensory properties are not characteristic for certain type of product. The outcome of these processes depends on the type of accidentally present microflora which means that fermentation can go in undesired direction leading to the spoilage of the product. The manufacture of relatively good products of standardized quality is possible providing that dominant microflora consists of hererofermentative species of lactic acid bacteria. If that is not the case, it is highly possible that such errors can lead to the manufacture of the product that is not fit for human consumption (*Slavica Vesković Moračanin, 2010*).

The production of safe product of standard quality is imperative in agenda of every serious food producing business. Adopting these principles results in continuous production and, from the other side, confidence of consumers and regulatory and official food control authorities.

Materials and methods

Traditional «uzicka» sausage was produced in the household of Nikola Brkovic in the Kacer village situated on the slopes of Zlatibor mountain. The sausage was made from beef and pork, firm fatty tissue, nitrite and common salt and S77 (Alimenta) within the three-months period (November 2008 – January 2009). The stuffing was filled into beef small intestine. Fermentation process lasted for 21 days. Basic properties, ingredients and ripening procedure of «uzicka» sausage are shown in table 1. Sausages were manufactured according to the traditional recipe, three batches (fermentations) being made during the entire experiment.

Table 1. Properties, ingredients and ripening procedure of «uzicka» sausage.

Type of fermented sausage	Sausage dimensions and weight	Casing	Ingredients	Quantity (100 kg)	Ripening process
<i>Uzicka sausage</i>	40 mm ø 41 cm in length 700 g	<i>Natural (beef small intestine)</i>	Beef Pork Beef small intestine Nitrite salt Common salt Spice S77 Alimenta	70 kg 20 kg 10 kg 2.5 kg 300 g 850 g	Ripening - 21 days at 2 - 13°C, 64% - 88% rel. hum.

After the filling, sausages were hanged on rods and left in the production facility at + 10 °C for a few hours (draining). After the draining they were transferred to the traditional smokehouses for smoking, ripening and drying in traditional manner. Smoking was carried out using cold procedure; smoke being obtained by burning beech on the open burner. Temperature and relative humidity was recorded hourly using electronic data acquisition system (175-H2, Testo, Germany). Air circulation was measured three times a day (morning, midday, evening) every day by digital anemometer (405-V1, Testo, Germany).

At the end of the ripening process, 5 expert panelists using quantitative-descriptive test carried out sensory evaluation. Overall acceptability was graded on the scale ranging from 1 to 10. Highest grade stood for best overall sensory properties typical for this product.

Statistical analysis of obtained data included determination of mean (\bar{x}), standard deviation (Sd), standard error (Se), interval of variation (IV) and coefficient of variation (CV). Statistical calculations were carried out using Statistica v7.00 software.

Results and discussion

Table 2 shows the values of relative humidity measured during traditional production of “uzicka” sausage in individual household. The results were expressed as average value calculated from 24 measurings during one day.

Table 2. Relative humidity during the production of “uzicka” sausage %

	1st day	7th day	14th day	21st day
I fermentation				
	72,67 ^{p, z, q, Q}	75,16 ^{q, Q}	69,35 ^{z, Q}	80,34 ^{o, Q}
Se	1,20	0,62	1,01	0,46
Sd	5,90	3,02	4,95	2,24
Range	22,40	13,90	19,00	8,20
Min.	58,20	66,50	59,70	76,30
Max.	80,60	80,40	78,70	84,50
Cv	8,12	4,02	7,14	2,79
II fermentation				
	72,64 ^{q, Q}	77,13 ^{z, Q}	80,65 ^{z, Z}	73,45 ^{q, Z, X}
Se	1,33	0,61	0,52	0,67
Sd	6,53	3,00	2,54	3,27
Range	26,10	12,20	8,00	10,20
Min.	62,20	71,20	77,90	69,10
Max.	88,30	83,40	85,90	79,30
Cv	8,99	3,89	3,15	4,45
III fermentation				
	82,23 ^{q, Z}	88,92 ^{z, Z}	70,06 ^{p, P}	70,11 ^{p, Z, Y}
Se	0,90	0,30	1,10	0,56
Sd	4,39	1,45	5,40	2,74
Range	12,00	4,80	21,40	10,60
Min.	76,50	85,80	55,60	65,90
Max.	88,50	90,60	77,00	76,50
Cv	5,34	1,63	7,71	3,91

We observed significant statistical differences during drying and ripening of “uzicka” sausage. Values were in the range from 69.35% (14th day) to 80.34% (end of ripening) in the first fermentation. Differences between values measured in the first 14 days and the end of the production process were statistically significant ($p < 0,001$), while between the 1st and the 14th day of production, no significant differences were ($p > 0,05$). In the second fermentation, values for relative humidity increased during the first 14 days (from 72,64% to 80,65 %), the last value decreasing in the last week of production to 73.45% which is significantly less compared to the 14th day ($p < 0,001$).

At the same time, we observed significant differences ($p < 0,001$) in relative humidity measured in the last days of investigation between I, II and III fermentation. These differences are the result of uncontrolled conditions during drying and ripening of “uzicka” sausage in traditional way of production. Table 3 shows temperature values during drying and ripening of “uzicka” sausage (means with measures of variation).

Table 3. Average temperatures during the production of "uzicka sausage, °C

	1st day	7th day	14th day	21st day
I fermentation				
	8,94 ^q	13,70 ^{z, Q}	9,11 ^{q, Q}	6,05 ^{o, A}
Se	0,30	0,33	0,37	0,07
Sd	1,49	1,63	1,81	0,36
Range	4,80	5,90	6,80	1,40
Min.	7,00	10,20	6,20	5,40
Max.	11,80	16,10	13,00	6,80
Cv	16,67	11,89	19,87	5,95
II fermentation				
	7,06	7,59 ^Z	8,58 ^Q	8,56 ^B
Se	0,31	0,86	0,36	0,45
Sd	1,53	4,19	1,74	2,22
Range	5,20	14,30	6,20	7,70
Min.	4,60	-1,20	4,70	4,70
Max.	9,80	13,10	10,90	12,40
Cv	21,67	55,20	20,28	25,93
III fermentation				
	8,89 ^{q, a}	6,53 ^{q, b, Z}	16,00 ^{z, Z}	6,25 ^{q, b, A}
Se	0,46	0,30	0,41	0,58
Sd	2,24	1,45	2,02	2,86
Range	5,30	4,70	8,50	9,20
Min.	6,10	4,00	12,10	1,90
Max.	11,40	8,70	20,60	11,10
Cv	25,19	22,21	12,63	49,76

Temperatures taken during the production were characteristic for the period of the year, however, certain variations were observed. Temperatures during the first fermentation ranged from 6,05 to 13,70°C and were significantly different ($p < 0,001$). In the second fermentation, the temperature was constant throughout the entire process with no significant differences observed ($p > 0,05$). During the third fermentation, the highest temperature was measured on the 14th (16°C), while average temperatures of other days were lower (8,89, 6,53 and 6,25°C). Significant differences determined within this experiment were the result of the influence of different periods of the year and different weather (November 2008 – January 2009).

Table 4 shows values of air circulation. The differences in this parameter were not significant ($p > 0,05$) and were 0,17, 0,17 and 0,16 m/s.

Table 4. Average air circulation during the production of “uzicka” sausage, m/s

	I fermentation	II fermentation	III fermentation
	0,17	0,17	0,16
Se	0,01	0,01	0,01
Sd	0,04	0,06	0,05
Range	0,14	0,31	0,15
Min.	0,12	0,09	0,09
Max.	0,26	0,40	0,24
Cv	23,53	35,29	31,25

Table 5 shows the results of sensory evaluation and overall acceptability of “uzicka” sausage with high grades given to various sensory (8,80 – first fermentation, 7,50 – second fermentation and 8,90 – third fermentation).

Table 5. Sensory evaluation of overall acceptability of “uzicka” sausage

	I fermentation		II fermentation		III fermentation	
	X	SD	X	SD	X	SD
“Uzicka” sausage	4,00	0,00	5,20	0,45	6,20	0,45

The quality and specificity of fermented sausages depends on applied technological procedure (traditional in this case), which is different in various parts of the world (Gasparik-Reichardt *et al.* 2005). It should be stated that sensory properties of traditionally manufactured meat products result from direct influences of many factors, firstly of the quality of raw material, spices, effects of epiphytic microflora and the conditions in which ripening, smoking and drying take place. (Turubatović L., Tadić R., 2005). Radetic (1997) suggests that the ambient temperature in smoking houses should not be higher than 20 °C, while optimal relative humidity should be 75–80 %. Surface of raw sausages that are partly dried, can be (according to this author) eliminated by short smoking at 85% of relative humidity. Vukovic (2006) states that fermented sausages should be cold-smoked at the beginning of the ripening process at the temperatures from 12 to 25 °C, and the drying should be carried out gradually regardless of ripening speed.

Conclusion

Undoubtedly, national food products represent one part of the cultural and historical heritage of people living on certain area. Ever-growing demand for traditional products and basic market requirements led to the need for defining the conditions for

controlled production of highly regarded “uzicka” sausage (standardized relative humidity, temperature and air circulation), as well as creating the possibilities of utilization of national starter cultures based on selected epiphytic microflora. The final result would be internationally recognized and, at the same time, safe product of high quality.

Acknowledgement

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ECONOMIC EFFECTS OF DRIED PEAR PRODUCTION USING COMBINED TECHNOLOGY¹

Veljko Vukoje, Ivan Pavkov, Mirko Babić²

Abstract

This paper analyses the expenses and results of dried pear production using combined technology. The research refers to a dryer of the capacity 450 kg of raw material per day, which is suitable for production on family farms. Drying of pears lasts for 20 days, while the period for drying all fruit lasts 135 days per year in total. Cost price of dried pear, in packages of 100-500g, is 376.8 RSD/kg. (3.59 €/kg). In the cost price structure the expenses of dried pear (56.7%) are the highest, while energy costs are low (2.8%). Substitution of wheat straw by natural gas in the process of convective drying increases energy costs to the still acceptable amount of 6.9%, so it can be an alternative in the present production conditions. The wholesale price of 590 RSD/kg (5.62 €/kg) makes the profit of 3,376 €/20 days in dried pear production.

Key words: *pear drying, combined technology, costs, profitability.*

Introduction

Pear is one of fruit sorts of the greatest quality and it is highly profitable in moderately continental climate. Apart from being consumed in the fresh state, pear is also suitable as a raw material for processing. There is a demand for the majority of processed products from pear on the domestic market, while it also presents an important item for export.

Fresh fruit processing in Serbia is generally restricted to production of alcoholic drinks, soft drinks, stewed fruit, marmalade and jams. There are no precise data on domestic production and consumption of dried pear, but it seems to be very low and insufficient. Domestic market is not sufficiently supplied with dried pear. In retail

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dried pears are available only in well-supplied health food stores and supermarkets. Therefore, there is great potential for further growth of domestic market for this product, having in mind the expected improvement of life standard and, thus, gradual changes in consumers' habits.

Continual supply of high quality raw materials is a prerequisite for the development of dried pear production. In spite of the constant decrease of the number of fruitful trees, the pear production Serbia is growing. In 2008, 61,886 tons of fresh pears were produced with around 4,400 trees. The territory of Vojvodina accounts for 17.4% of the production (Statistical Yearbook, 2009). High-quality cultivars are present to a sufficient degree, predominantly the cultivar "William", which is generally used for drying.

The quality indicators of dried pear (colour, shape, texture, flavour and aroma of dried fruit) currently available in retail are not outstanding. The main deficiency is inadequate drying technology. The question that arises is whether applying of combined technology, which provides better quality of dried fruits, would contribute to achieving corresponding economic effects, as well.

Material and methods

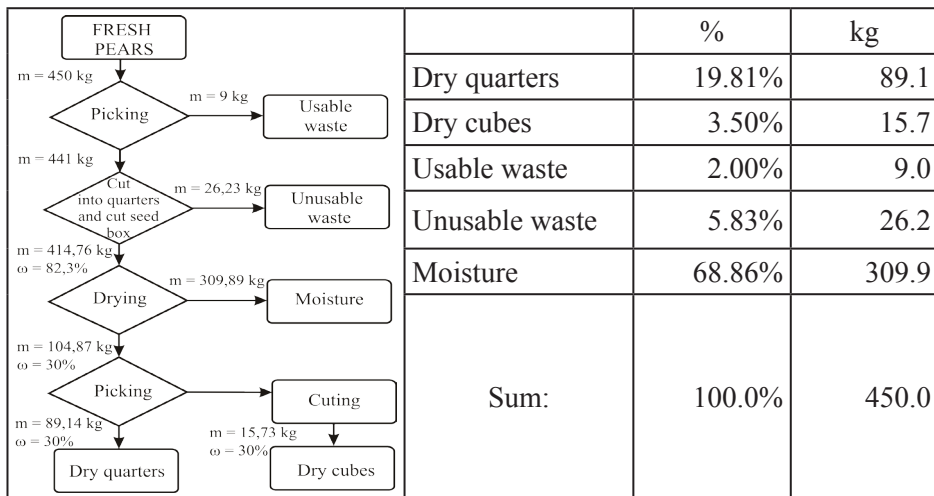
Pear can be dried by applying different technological procedures, and by using various technical solutions for drying devices. The paper examines economic effects of pear drying by combined technology combination of osmotic and convective drying, (Babić Ljiljna et al., 2003). It is a relatively small capacity plant, suitable for production on family farms. There are a number of advantages if combined technology is used in drying fruits compared with classical drying technologies. These advantages refer to preserving the quality of dried fruit (natural colour, aroma and flavour), to the extended period of storing with higher moisture content and it is more rational in terms of energy consumption (Kil et al., 2002, Babić M. et al., 2005, Pavkov et al., 2009, Guine, 2006).

In a Laboratory of Bio-systematic Engineering of the Faculty of Agriculture in Novi Sad, original devices for drying fruit with combined technology were designed. Previous laboratory research showed that this technology is suitable for drying various sorts of fruit, including a pear cultivar "William". The products are of good quality, mass balance is favourable, energy consumption rational, while there is also the possibility of using solar and biomass energy.

The research is supposed to test whether drying of pears using combined technology can be cost-effective on family farms. Calculations are based on the following most important technical-technological and production-economic presuppositions:

- Production is performed on a registered commercial farm, which is included in VAT system and has the status of an entrepreneur;
- Realistic daily capacity of the dryer is 450 kg of fresh pear, pre-calculation of costs and results is based in the following mass balance (Fig. 1):

Fig. 1. Diagram of technological procedure for pear processing by drying with mass balance; [m – mass (kg), ω - moisture content (%)]



- Continual supply of raw material is provided from the area within 60 km, cold storage is not necessary;
- The plant is used effectively for 135 days per year, out of which 20 days are used for drying pears (9,000 kg of fresh, i.e. 2.097 kg of dried pear), while the rest of the days are used for drying other sorts of fruit (sour cherry, nectarine, peach, apricot, quince, plum and apples);
- Thermal energy for osmotic drying is generated from electric energy, while for the convective drying it is generated from wheat straw;
- Work is organized in three shifts, requiring five workers, one of whom is required to be well qualified for drying technology;
- Calculations are based on realistic market prices of input and final products, all the prices are without VAT, free delivered (1€ = 105 RSD);
- Investment in procurement of equipment and tools as well as facility construction (30 m²) amounts 17,500 €, half of which is financed from credits with the interest rate of 5% and repayment period of 4 years, while the working capital is entirely financed from own resources.

The analysis is primarily based on analytic calculation of production costs for dried pear. The emphasis is placed on the calculation of technological operations (preparation of material, osmotic drying, convective drying and finalisation). This form of calculation system enables detailed itemisation of costs, and, therefore, more precise cost calculation, and provides more possibilities for costs and results analyses.

Aiming at a more reliable evaluation of cost-effectiveness, certain additional absolute and relative success indicators were determined. The most important economic indicators are compared with production results of dried apricot produced using the same technology.

Results and discussion

Direct costs are primarily calculated for a dryer of daily capacity of 450 kg of fresh pear; then, on the basis of the established RSD exchange rate, calculations for 20-day pear production are made (Table 1).

Table 1. Production calculation of dried pear (1€ = 105 RSD)

Dryer capacity: 450 kg of fresh pear per day, i.e. 9000 kg for 20 days							
No	TECHNOLOGICAL OPERATION	Unit	Quantity	Price RSD/Unit	RSD/ 1day	€ / 20 days	
1	Fresh pear	kg	450	50.0	22500	4286	
2	Sulphur	kg	0.40	154.4	62	12	
3	Water	l	950	0.113	108	20	
4	Labour costs	h	19.2	170	3264	622	
I	Preparation of material for drying				25933	4940	
5	Electrical energy	kwh	49.9	6.97	348	66	
6	Sugar	kg	7.1	46.7	332	63	
7	Water	l	50.0	0.11	5.7	1.1	
8	Labour costs	h	4.8	170	816	155	
II	Osmotic drying				1501	286	
9	Electrical energy	kwh	14.4	6.97	100	19	
10	Heat energy (straw)	kg	176.0	3.70	652	124	
11	Labour costs	h	8.0	170	1360	259	
III	Convective drying				2112	402	
12	Package				6825	1300	
13	Labour costs	h	8.0	170	1360	259	
IV	Finalisation				8185	1559	
A)	VARIABLE COSTS (1 to 13)				37732	7187	
14	Depreciation and maintenance				1180	225	
15	Overhead costs and interest				778	148	
B)	TOTAL COSTS (1 do 15)				39690	7560	
	ACHIVED RESULTS	Unit	Quantity	Selling price	RSD/ 1day	COST PRICE	
						RSD/kg	€ / kg
16	Dry slices	kg	89.1	590	52593	376.8	3.59
17	Dry cubes	kg	15.7	295	4640		
18	Usable waste	kg	9.0	20	180	20.0	0.19
C)	PRODUCTION VALUE (16 to 18)				57413		10936
D)	PROFIT (C - B)				17723		3376

For calculating the general costs the procedure is inverted: the costs are determined on a yearly basis, and then divided by 135 days of planned effective operating of the dryer, to reach a daily amount.

Technological operations include a number of working activities (e.g. "preparation of material": receiving fruit, washing, selection, cut into quarters and

sulphuring). Material and energy consumption are based on the results of previously performed laboratory research (Babić, M. et al, 2004). Most of the costs arise during the very first operation (65.3%), which is expectable, as it includes the values of fresh pears and requires a lot of manpower.

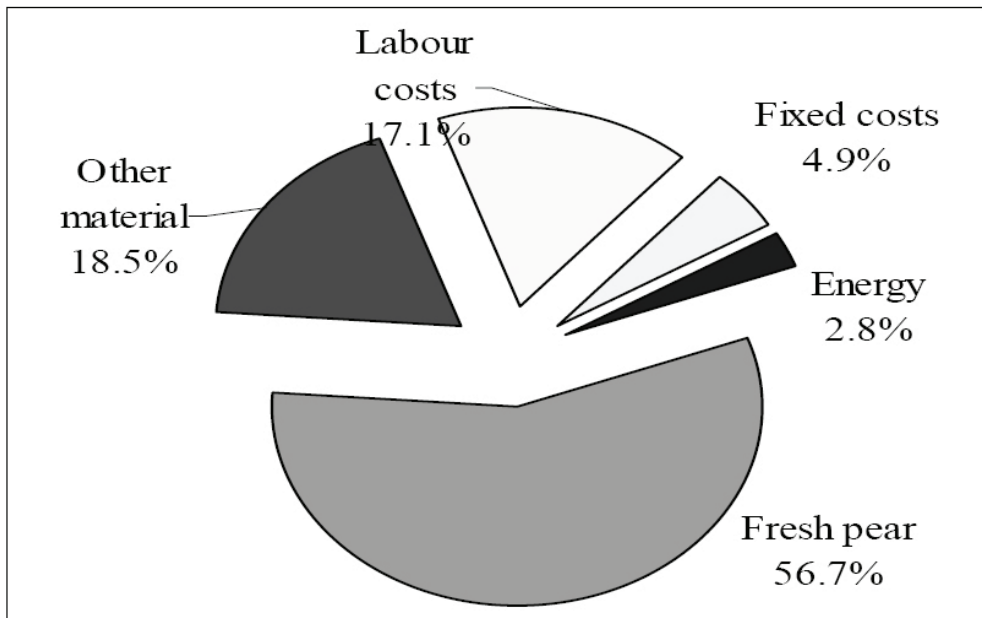
Regarding the overall costs, as expected, the costs of fresh apricot as the basic raw material are dominant with 56.7% (Fig. 2). Significant share of manpower (17.1%) can be explained by a low level of plant automation.

The demands for thermal energy in fruit drying depend on physical and thermo-physical properties of fruit to be dried and the dryer. By applying combined drying, the overall consumption of thermal energy is decreased. If wheat straw is used as fuel for convective drying, with the mean values of lower thermal power $H_d = 13,000$ kJ/kg, the mass 176 kg/day is required.

The share of energy costs is very low (2.8%), which is partially due to using biomass (wheat straw) for convective drying. This fact questions the common opinion that energy costs are crucial for cost-effectiveness or ineffectiveness of dried fruit production. Apart from the already mentioned automation of the process, this can be attributed also to the current low price of electric energy.

Logically, there is the issue of substitution of straw by natural gas, which is from the technological and organisational viewpoint considerably more suitable fuel. The equivalent amount of natural gas is

Fig. 2. Costs structure of dried pear (%)



71.5 m³/day (lower thermal power $H_d = 32.000 \text{ kJ/kg}$), which, for the price of 33.78 RSD/m³, amounts 2,415 RSD/day. This increases the costs of energy in dried pear production for 336€ /20 days, but their share remains acceptable with 6.9%. This does not jeopardise considerably the cost-effectiveness and it is certainly justifiable to consider it seriously in the current production conditions.

Fixed costs account for 4.9% of the overall production costs. Depreciation and maintenance are dominant costs, while interest in investment credits is not significantly high (0.7%, i.e. 358€ on the annual basis). Cost price of dried slices and cubes is the same, and it amounts to 376.8 RSD/kg (3.59 €/kg). Since the cost price of by-products (usable waste) equals the selling price, the success of the whole production depends on the main products.

When we calculate 20% trade margin and 18% VAT to the wholesale price of dried quarters of 590 RSD/kg, we get the retail price of 835.4 RSD/kg (7.96 €/kg). That price is significantly lower than the average price of packed pear which can be found in our shops. Furthermore, dried pear produced with combined technology has important competitive advantages in terms of quality.

The expected level of sales price ensures the profit of 3,376 € for the planned 20-day production of 2,097 kg of dried pear (Table 1). This is around 2.3 time better result than in dried apricot production using the same technology, which makes the profit of 1,482€ /20 days (Vukoje and Pavkov, 2010).

Since throughout the year some other fruit sorts are dried, as well (sour cherry, nectarine, peach, apricot, quince, plum and apple), and since they have different levels of profitability, it is not possible to make accurate projections of success indicators on the annual level, based only on the data on dried pear production. However, having the assumption that dried pear production reflects the average level of cost-effectiveness on the annual level it is possible to draw a number of useful indicators of cost-effectiveness of using dryers. In this case, the total profit for 135 days of effective dryer functioning can be assessed for about 10,000€.

Since the fixed costs mostly do not change during a short period of time, the cost-effectiveness of certain production can be discussed more appropriately on the basis of the gross margin than on the profit basis.

A farm can have significant additional benefit if employing two members of the family (40% of manpower). In this case the profit can be expressed by the income of the farm (3,894€). The additional benefit amounts 518 € from the process of pear production, i.e. about 3,497 € per 135 of work days.

Table 2. Additional indicators of success

No	TYPE OF INDICATOR	€/ 20 days
1	Gross margin (C – A)*	3749
2	Farm income (D+40% Earning)**	3894
3	Production efficiency (C / B)	1.45
4	Production accumulation (D / C)	30.9%
5	Economic flow (average profit + depreciation) **	1662
6	Time of investment return	1.56

* Marks refer to the data given in Table 1

** The amounts in No. 5 and 6 are calculated on the basis of the assumed “average profit” of 1.482€/20 days, which correspond to dried apricot production.

Cost-effectiveness coefficient (1.45) and profitability rate of production (30.9%) also have very good values, considerably better than in dried apricot production (1.31 cost-effectiveness, i.e. 23.9% of accumulation; Vukoje and Pavkov, 2010). The total investment is repaid for around 1.56 years, which is a highly acceptable period.

Conclusion

The analysis of technological and economic parameters show that dried pear production using combined technology on family farms can be very profitable (profitability rate is 30.9%), even if the price of fresh pear substantially increases. Regarding the costs structure, the costs of fresh pears are the highest (56.7%), while the energy costs are quite low (2.8%).

The observed scope of processing (9,000 of fresh pear, for 20 days) makes the profit of 3,376 €. Significant additional profit in the form of earnings can be made in the amount of about 3,497 € per year, if employing family members.

No large investment is necessary to start the production (up to 18,000 €). The existing specific-purpose funds and credit lines in Serbia enable people to take loans under relatively favourable conditions. The investment is to be paid back in about 1.56 years, which is a very short period of time. Evidently, there is not only natural but also market potential for development of such business in Serbia.

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MODULAR TOOL FOR DAIRY COW RATION OPTIMIZATION: SPREADSHEET BASED APPROACH

Jaka Žgajnar¹, Stane Kavčič²

Abstract

Paper presents developed spreadsheet tool for dairy cow ration formulation. It is constructed on the basis of two linked modules in MS Excel platform, merging common linear programming and weighted goal programming model with penalty functions. The first module estimates the least-cost magnitude that might be expected. Obtained result enters into the second module as goal that should be met as close as possible. The tool was tested at two different values of preferential weights for dairy cow with 20 kg daily milk yield. Obtained results confirm benefits of applied methodology since one is enabled to formulate least-cost ration and simultaneously overcome major drawbacks of LP approach. Besides fine tuning of set goals rational violence is enabled through penalty function system. As result calculated ration is more efficient both from economic and nutritive point of view.

Key words: *linear programming, weighted goal programming, penalty function, spreadsheet ration optimization, dairy economics*

Introduction

Many external factors (e.g. milk quota abolition, CAP reforms, fodder price fluctuations, climate changes) have significant impact on economic indicators in dairy production. Since forage costs already present up to 55 % of total variable cost, ration formulation is becoming the fundamental lever in daily dairy management. With increasing volatility of fodder prices this is even more important.

It is extremely complex and time consuming process to formulate an efficient ration that take into consideration nutritional, economic and also environmental factors. In the case that it is done by trial - error method (by hand), particularly non-nutritional facts (economics and environment) might be neglected. Both issues deteriorate also diets' efficiency.

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Literature review

In the literature one could find numerous examples of utilizing operation research techniques for solving nutrition management problems. The most common are least cost ration optimization based on linear programming, starting with Waugh (1951). Even though LP approach is suitable for solving nutrition management problems, it has some drawbacks and might therefore be deficient method for ration formulation (Rehman and Romero, 1984; 1987). This is especially true when it is used as an 'engine' in an end-user application.

The two basic concepts of LP are single objective function and fixed (rigid) constraints, defined by right hand side (RHS) of equation and matrix specification. These means that only one objective might be optimized at once (e.g. cost minimization). However, ration formulation is quite complex process and reduction of several objectives into only one - cost minimization objective - is too rigid assumption. Nutrition management is one of business problems demanding multi objective consideration (Lara and Romero, 1994).

Fact that all nutrient requirements are estimated on the basis of numerous equations, points out the second basic LP assumption. It means that no constraints' violence is allowed at all, irrespective of deviation level (Rehman and Romero, 1984). In many real situations this might manifest in fact that LP model has no feasible solution. However, relatively small relaxation in RHS would not seriously affect animal welfare, but would result in a feasible solution (Rehman and Romero, 1987; Lara and Romero, 1994). Another problem concerning RHS is also the fact that constraints are usually defined only in one direction. This could reflect in rise of prime-cost or, what is lately becoming even more important, increase pollution with surplus elements and green house gas (GHG) emissions (Brink et al., 2001) due to unbalanced ration at different stages.

When ration optimization is the case, mentioned drawbacks might be reduced by multi criteria decision making (MCDM) concept (Rehman and Romero, 1984). The most pragmatic and commonly used method within MCDM techniques is weighted goal programming (WGP) (Tamiz et al. 1998). Its mathematical framework is familiar with LP, which enables simplex algorithm utilization (Rehman and Romero, 1993).

WGP technique enables one to optimize several objectives at once. Crucial objectives that are usually in contradiction might be converted into goals and the rest of objectives can be considered as constraints. Theoretically goals could be satisfied either completely, partly or in some extreme cases some of them might also not be met. This violence is enabled through deviation variables. They are measured using positive and negative deviation variables that are defined for each goal separately and present over- or under-achievement of the goal. This is also the main difference between LP and WGP, as objective function in WGP paradigm minimizes the undesirable deviations from the target goal values and does not minimize or maximize goals themselves (Ferguson et al., 2006).

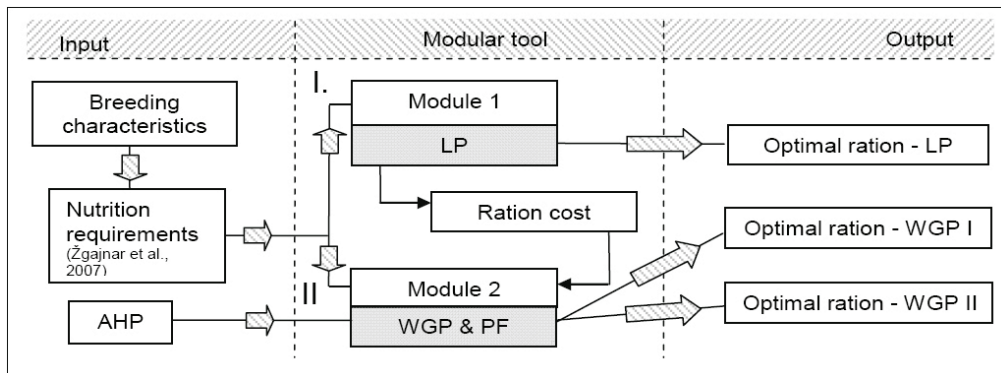
Quality of obtained results is strongly dependent on selection of preferential weights. Since any deviation is undesired, the relative importance of each deviation variable is determined by belonging weights. They can be set either by expert estimation or with analysis of shadow prices. To reduce bias of obtained result also alternative technique to define weights could be used, as for example Saaty's Analytic Hierarchy Process (AHP) (Gass, 1987).

One of main drawback of WGP is concerning marginal changes. Namely, within one goal all changes are of equal importance (constant penalty) no matter how distant they are from the target value (Rehman and Romero, 1987). This addresses another new issue in ration formulation. In some situations too big deviation might lead to fail animal’s requirements within nutrition desirable limits, and obtained solution is useless. To keep deviations within desired limits and to distinguish between different levels of deviations, system of penalty functions (PF) might be used to support WGP (Rehman and Romero, 1984). PF enable one fine tuning of positive and negative deviation intervals for each goal separately.

Material and methods

The paper presents an attempt of mathematical programming techniques that could be applied in daily management tasks in dairy sector. To be user friendly and available to end users, it is developed in MS Excel framework. The modular tool is based on LP and WGP supported with PF. The first module is a classical example of least cost ration formulation. Its purpose is to get rough estimate of the ration cost, required in the second module (Figure 1)³. Presented tool is developed as an open system, which means that all input data are recalculated for analysed case. This is enabled with another already developed model (Žgajnar et al., 2007) that calculates animals’ daily requirements and is linked with presented tool (Figure 1).

Figure 1 - Scheme of optimization tool



The tool was tested for a 600 kg dairy cow in the 120th day of lactation (presumed lactation milk yield was 5,000 kg) with a daily milk yield of 20 kg and nutritional requirements for 60th day of pregnancy. The most important constraints and goals for analysed case are presented in Table 1.

³ Approach with mathematical description of models (LP and WGP+PF) is precisely described by Žgajnar et al. (2010); the main difference is that the models are there applied for beef ration formulation.

Table 1 - Daily requirements for dairy cow with 20 kg milk yield at 60th day of pregnancy, presented as constraints (LP) or set of goals (WGP)

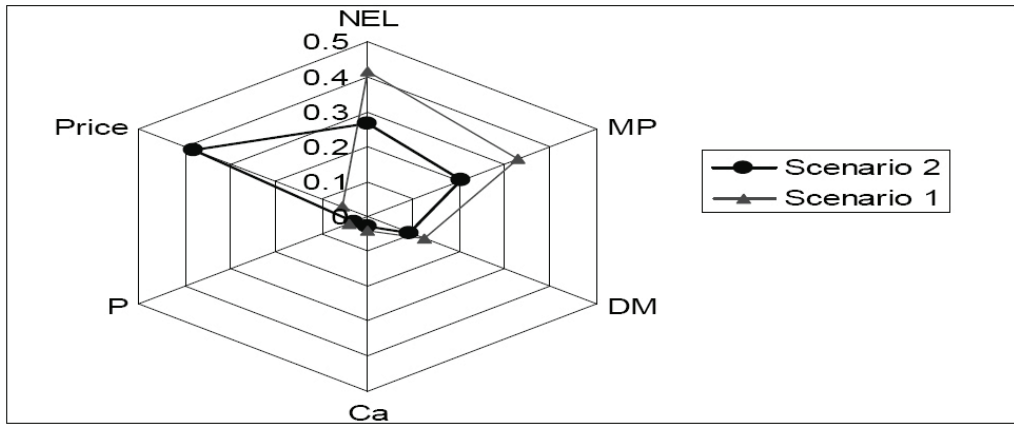
		Daily requirements		Penalty function			
		Summer/winter		Interval 1		Interval2	
		LP	WGP I / II	s1-	s1+	s2-	s2+
NEL	(MJ)	>102.1	102.1	0.5%	0.5%	1%	1%
MP	(g)	>1,219.3	1,219.30	0.5%	0.5%	1%	1%
DM	(kg)	<16.4	16.4	5%	0%	15%	0%
CF min	(kg)	>3.0					
CF max	(kg)	<4.3					
Ca	(g)	>86.5	86.5	5%	10%	27%	27%
P	(g)	>57.7	57.7	5%	10%	27%	27%
Ca:P	(%)	(1.5-2):1					
K:Na	(%)	(5.5-10):1					
Price	(cent)		<i>CI</i>	∞	10%	∞	20%

Basic set of constraints is in both models (LP and WGP, supported by PF) more or less the same. Nutritional constraints presented in Table 1 differ only in mathematical sign when nutrient requirements are transformed into goals. In the case when least cost criterion is considered (LP) only the most important (non-conflicting) minimum or maximum constraints must be met. This might manifest in 'unreasonable' ration. Anyhow, this simplification has been applied since LP module is utilised only to give rough estimation of the lowest possible diet cost.

In everyday ration formulation process one has to consider also constraints concerning quantities of feed that must or might be included into the ration. In our case study we assumed that ration should include at least 3 kg of hay and its quantity should not exceed 5 kg. Both modules should also not exceed the maximum quantity of grass and maize silage (30 kg/day).

Initial version of WGP model involves six goals supported by PF (Table 1). Relative importance of each goal is defined by belonging weights, summing to one. Weights have been estimated with AHP approach, based on pair wise comparisons. As it is apparent from Figure 2, two different scenarios have been tested with the crucial difference in preferences of cost goal. In the first scenario cost of obtained ration (WGP I) was of minor importance (0.05), while in the second scenario (WGP II) its importance was increased (0.38). In both scenarios deviation intervals remain the same (+10 % and +20 %). The most important goals to be met were satisfaction of energy (NEL) and protein (MP) requirements. In both cases deviation intervals are very restricted, since only 0.5 % positive and negative deviations are allowed in the first scenario and 1 % in the second one. Much lower weight is foreseen for the dry matter intake that presents consumption capacity. In this case deviation intervals are defined only for underachievement of the goal, while overachievement is for practical reasons (consumption capacity) not allowed. Besides that, additional constraint is included to ensure that proportion of dry matter derived from voluminous forage does not exceed 14 kg.

Figure 2 - Relative weights of six goals



The ingredients assumed to be available for formulating the rations and their characteristics are given in Table 2. Grass might be included only in summer ration. We assumed that all voluminous forage (hay, maize silage, grass silage and grass) is produced on the farm. Since these forages are usually not tradable, we estimate total cost of their production on the basis of ‘model calculations’ (KIS, 2007). All other forage and mineral-vitamin components on disposal could be purchased at market prices (Table 2).

Table 2 - Nutritive value of feed on disposal

	DM	NEL	MP**	CF	Ca	P	Mg	Na	K	Price or TC*
	(g/kg)	(MJ/kg DM)	(g/kg DM)							(cent/kg)
Feed on disposal										
Hay	860	5,90	85,00	270	5,70	3,50	2,00	0,35	18,25	15,30
Maize silage	320	6,50	45,00	200	7,06	6,00	1,91	0,12	10,76	3,70
Grass silage	350	5,60	62,00	260	6,00	3,51	2,20	0,35	21,30	6,14
Grass	160	7,10	121,00	205	6,00	2,60	2,00	0,10	10,50	1,50
Maize	880	8,50	83,00		0,23	4,09	1,25	0,23	3,75	30,00
Wheat	880	8,60	88,00		0,57	3,86	1,59	0,45	5,00	32,00
K-18***	880	7,61	136,74		10,23	5,68	2,84	3,98	10,23	27,67
K-19***	880	7,61	146,51		10,23	5,68	2,84	5,11	10,23	30,00
Mineral and vitamin components										
Limestone	950				400					16,40
MVM1****	930				160	100	36	120		67,56
MVM2****	930				210	70		135		58,08
Salt	950							400		50,00

* Total cost for voluminous forage

** The minimal values of metabolisable proteins

*** Commercial names of dairy cows feed containing different % of metabolisable proteins

**** Commercial name of mineral- vitamin mixtures are Bovisal summer and Bovisal winter

Results

The tool has been tested on a practical everyday example in dairy production. Formulated daily rations for both scenarios are presented in Table 3, including LP solutions. The latter serves only for estimation the diet least-cost possible (Figure 1) and might not be really applicable.

There is a significant difference between winter and summer rations and also between rations in each season (Table 3). The first one is self-explanatory with grass on disposal only in summer, while the second difference manifests scenarios' assumptions with different preferential weights and PF in place.

In winter rations (WGP I and WGP II) protein requirements are mainly covered with grass silage and purchased fodder K-19 (WGP I) and K-18 (WGP II). It is obvious that prices play significant role as more restricted cost conditions (WGP II) have significant impact on inclusion of (expensive) grass silage. This is even more obvious in summer season, where the main source of proteins is much cheaper grass (both WGP I and WGP II). Grass is therefore the crucial trigger for the difference between summer and winter rations composition.

Table 3 - Obtained daily rations formulated with LP and cost penalty function scenarios

		Daily ration						
		winter			summer			
		LP	WGP I	WGP II	LP	WGP I	WGP II	
Feed used (kg/day)								
	Hay	5.00	5.00	5.00	3.00	3.00	3.00	
	Maize silage	27.98	3.89	13.23		18.44	18.80	
	Grass silage		16.94	13.58				
	Grass				71.38	33.50	33.77	
	Maize		3.26	0.30		1.26	1.12	
	K-18	1.03		2.88	0.86			
	K-19	2.54	1.49					
Mineral components used (g/day)								
	Limestone		25.0			13.9	12.3	
	Bovisal Summer				153.9	29.6	30.8	
	Bovisal Winter		14.0					
	Salt	8.3	30.0	30.0		30.0	30.0	
Price (EUR/day)		2.85	3.40	2.99	1.87	2.06	2.03	
Price deviation (%)		0.0	19.3	4.9	0.0	10.0	8.7	
Requirements deviations (%)								
	NEL	5.3	-1.0	-1.0	0.0	-1.0	-1.0	
	MP	0.0	0.0	0.0	39.8	0.5	0.5	
Total deviation*		94.9	25.8	55.3	80.6	38.3	39.5	
Physical ration attribute								
	CF (%)	18	19	20	20	20	20	
	DM (kg/day)	16.4	15.7	16.1	14.9	15.0	15.1	

*Total sum of deviations (including mineral deviations not presented in the table)

Penalty system enables one to control deviations from set target values (goals). More severe cost penalty system in the second scenario (through higher relative importance $w=0.38$) has in both seasons significant impact from nutrition quality aspect. More balanced WGP I ration is in summer season for 10 % more expensive in comparison with LP, while in the winter season the difference is close to 20 %. Difference between WGP II and LP is smaller and WGP II rations seems acceptable also from quality aspect.

Energy and protein requirements are fully met only in LP. Therefore at first glance least cost ration seems best solutions. However, if one considers also the sum of total deviation as measure of the 'quality' of obtained results, it is obvious that WGP rations are better. It is clear that LP neglects some nutrition objectives. This could be explained as competition between nutrition quality and economics. Also environmental impact is not negligible.

Conclusions

Paper presents a simple modulator tool that can support dairy cow ration formulation. Applied approach, combining different mathematical programming methods, proves as useful 'engine' in end-user application. It enables one to formulate close to least cost ration not taking too much risk of worsening the ration's nutritive value that is the main common drawback of LP. Rations might be additionally improved with fine tuning enabled through PF that differs between deviation sizes for each goal separately. This significantly proves in obtained rations, especially in winter season. If only least cost criterion is considered, there is almost 40 % surplus of proteins in the summer ration, which might seriously affect animals' health. In spite of cost increase, total efficiency could be improved through numerous factors.

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*Possibilities for exploitation
of agricultural potentials
in tourism*

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Possibilities for exploitation of agricultural potentials in tourism

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Economics of agriculture

SI – 2

UDK: 338.48-44 (1-22) PETROVAC/M

RURAL DEVELOPMENT AND RURAL TOURISM IN THE MUNICIPALITY OF PETROVAC NA MLAVI

Vedrana Babić¹, Radovan Lala Davidov², Marko Jovanović³

Abstract

Community Petrovac na Mlavi is located in Eastern Serbia, in county Branicevo. His spread 654. 9 km². By the census in this community lives 45 706 inhabitants (Serbian and Vlahian origin). City Petrovac as the center of community has 8 772 inhabitant. Relief is represented with hills and plains. Climate is moderate continental. Hidrography is represented by river Mlava with her frubuteries. Tis community is tich with different animal and herbal species.

Economy of community is undeveloped, but natural and antropogenik fortune, peace, silence, green nature, loveliness of housekeeper... are important potential for development of rural tourism.

Plan of community Petrovac is to give a special attention for development of rural tourism and activation of country' s housing and inhabitation on this community. The theme of paper is a connection between rural (sustainable) development and rural tourism like possibility of development in community Petrovac. Rural tourism throughout the country, especially in economically disadvantaged and less developed areas, such as municipalities Petrovac na Mlavi, can have multiple positive effects not only on individual rural households, but also the overall development of rural space. The cause is to show a possibility of development a rural tourism on this area. Authors of this work is date collection trough experience on tarain, area monitoring and benchmarking.

Key words: Community Petrovac na Mlavi, rural development, rural tourism

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Introduce

To stop the process weakening the village, land reclamation and the depopulation of rural areas, it is necessary, in accordance with the idea of sustainability, to position tourism business which in earlier development policies and concepts pertaining to these areas, it is not appropriate given the expansive role.

Tourism is developing in areas of special natural resources that other sectors of the economy can not form the basis of business. The biggest tourist markets are the developed countries, and tourism through the allocation of income from the developed areas in undeveloped areas, enriching the space with new investments.

Municipality of Petrovac na Mlavi belongs Branicevo county, which is the largest natural intersection of roads in this part of Europe.

It crossed the Danube highway, which connects Central Europe to the Black Sea coast and the Morava - Vardar road, which connects the Danube and Pannonia with the Aegean world. Represents a huge diversity of peoples, cultures and civilizations.

The goal is to strive to balanced development in rural areas through sustainable tourism.

Rural development and rural tourism

The concept of sustainable development has a progress in the eighties of the twentieth century.

One definition of sustainable rural development means that "sustainable development is the management of natural resources and their conservation, commitment to technological and institutional changes so as to preserve centuries-old legacy and to continue to meet the basic needs of people, as the present, and future generations. Such sustainable development in agriculture, forestry and fisheries, which preserves land, water, plant and animal genetic resources, is environmentally protected, technologically appropriate, economically viable and socially acceptable "(FAO, 1988)

In Serbia every year on 4, 6 million hectares of agricultural land produces about 10 million tons of agricultural products worth about 3, 3 billion (in 2006).. The territory of the municipalities of Petrovac na Mlavi occupies an area of outstanding and diverse natural features. It occupies an area of 655 square kilometers with 34 settlements living in 45 706 people (according to the census of 2002.). The relief is hilly - flat. Climate has a moderate continental. Hydrography is represented by river Mlava with her frateries. The area is rich in diverse flora and fauna.

Of the total municipal territory agricultural land covers 72% (46 900, 87 hectares) while 65, 80% of the population engaged in agriculture as its core activities. Registered 2296 farms. The average farm size is about 3, 79 acres, while the average size is only 28, 80 acres.

Thanks to the vicinity around the area, rivers, forests, rolling hills, there are opportunities for the development of many types of tourism, and contribute to the

attractiveness and cultural - historical monuments and many tourist - entertainment events.

The weak economy of this region suggests that potential investors should look outside the area. However, given that a large number of residents temporarily working abroad, investment in the tourism sector can be a motivator to attract capital to this region. There is no doubt that this territory is a significant tourism potential in the form of natural and human resources deployed in the territory of these municipalities. Despite the lack of built in traffic and tourist infrastrukturi, natural and cultural attractions to stamp this area and represent a "reservoir" of future tourist attractions. Therefore it is necessary to react quickly and put emphasis on environmental compatibility, social responsibility, the optimal satisfaction of tourist needs and economic profitability ... At a time when it is lived fast and unhealthy food, inhaling the smell of smog and exhaust gas increases, the direction of tourist flows to rural destinations (world average is about 10 percent). Since the rich historical significance and tradition of this primarily rural region offers a rich heritage and strong cultural identity. An important factor for rural development and tourism, the local culture. It's all a creation of man through interaction with the environment: social (landscape, clothing, food, architecture) and traditional (knowledge, skills, language, dialect ...).

In the municipality of Petrovac na Mlavi lives people of Vlachs and Serbs origin. Although there are clear and pure Serbian Vlach villages, living together in the true sense of the word.

About The Vlachs people are a relatively little has been written. Mainly information about them can be found in the description of customs, costumes and economic life.

However, a lot of unknown origin, the high mobility and the impact of the Vlach population in the formation of modern demographic picture. F. Kanitz shows Vlachs as a very hospitable and cheerful people. "Their costume is very original and colorful. By the huge winter hat, a leather bra and a white linen trousers below the knee Vlach ligation can be recognized already from a great distance. For Vlachs women the love of the colorful connection is much higher than in Serbian. His features are in Vlachs women soft and make you break out but the Serb, awful eyes and body movements inherent in a special grace, which is reminiscent of Italy's "(Kanitz, 264 -265).

In the interesting customs and equally participate in all the fun and the glory of the star in each other. Interesting folklore and authentic architecture of its old cottages, mills and give a special touch and tourism potential of all Homolje municipalities. Traveler in this region will always be nice and warm hospitality that welcomed and will receive here will surely long be kept in memory, and will want to re-visit this area ...

The region is specific for the multinational composition of the population and the food compared to other regions specific. Dominate food from own production, grown on the basis of a healthy diet, without spraying and artificial recharge, because just looking for specialties such foods. United Nations building, which is a bit to say that the healthy food, encourage the courts that are still environmentally clean. The healthiest are foods produced by nature itself, without the presence of man.

Modern man has already begun to forget the dishes which were fed to his old one. One of the main motives in making the decision for a particular destination is the cuisine of the area. The development of rural tourism and offers traditional dishes, and in this part of Serbia they have plenty: Cus, plašinte, žumjare, čulama, kolješa ...

Examples of reviving traditional crafts as a result of rural development are present in the Municipality of Petrovac na Mlavi and are closely associated with supply in rural households. The Bistrica, protected ethno - village, was restored in 12 mills - mill where the grinding wheat and corn flour. In the neighboring village of throat are the initial steps to restore production of hand-woven rugs, colorful handbags, as well as making traditional cradles of carved wood.

Folklore, food, costume, direct contacts with people on the street - in a word everything that makes life a nation, or rather his features, is a special and very complex group of attractive cultural tourist motives.

Rural tourism is tourism of local character, local initiatives, with local management, which generated revenue remains the local community. However, the experiences of countries in which this kind of tourism has developed significantly, however, show that state that for the most part, the different legal regulations and subsidies, could help this type of tourism and rural development. The most significant relationship between agriculture and tourism is rural tourism. In many European countries, provides rehabilitation and revival of agricultural areas through increased employment of rural population.

Agriculture and tourism meet a range of functions of vital importance not only for people who live there, but also society as a whole: provide food and renewable raw materials, maintain habitat for flora and fauna, which contributes to maintaining a healthy environment (ecology), representing important recreational and tourism potential.

In the European Union which, on the one hand, reached a high level of economic development, and in which, on the other hand, the economic importance of agriculture declined significantly, rural development not only survives, but in recent years and significantly strengthened.

Rural population still has an important role in the demographic, social and economic process. According to an estimate of the Organization for Economic Cooperation and Development (OECD), which is based primarily on population density, rural areas occupy about 90% of EU territory. More than half the EU population lives in these areas and over 40% of domestic products are produced there.

The European Union has entered the fourth generation of rural development plan (2007 - 2013). The main objectives of rural development policy in the EU are:

- Increase the competitiveness of agriculture and forestry by supporting restructuring, modernization, innovation and improving the quality of production;
- Measures to improve the environment: are aimed at protecting natural resources, preservation of traditional rural areas and improving the biodiversity (biological diversity) by which I should be understood and appropriate management of land resources, which takes into account specific environmental conditions of a

region (in relation to material compensation received farms in high - mountain and other areas where the soil is less fertile, but under the condition that does not harm the environment);

- Improving quality of life and incentives for a variety of economic activities in rural areas, in what are among the additional activities on farms, such as rural tourism; (Lazic, 2007)

Rural tourism is often considered essential for a sustainable form of tourism. This type of tourism attracts few tourists who do not have a major impact on the destination (in terms of damaging the environment), does not require significant investments in infrastructure, while tourism demand is interested in local culture, its introduction and cultivation. Rural households with current production do not make a satisfactory income, additional activities can provide additional income, in which they use knowledge and practical skills, natural resources, available facilities, agricultural products and forest trees, as well as the appropriate machinery and equipment.

For Serbia, the agriculture is a very important economic sector. It employs, directly and indirectly a large number of inhabitants, ensure nutrition of the population, is a significant exporter, is the most important factor in rural development, ensuring ecological balance ... The share of agriculture in national income of the Republic of Serbia is 21% and 26% export income. The average size of rural households in Serbia at 2, 37 ha. According to the Ministry of Agriculture only 5, 5% of farmers deals with possession of more than 10 ha. Farmers with small areas of agricultural land, often found in a number of problems on the production and marketing. In a large dependence on market and environmental conditions, and sometimes are not able to start a new cycle of production. Rural tourism provides an opportunity for income generation and activation of the entire family. Therefore, it is an activity that can help to provide additional economic effects. Through modification of traditional rural activities that are now declining, rural tourism tends to reduce the outflow of rural population.

Conclusion

Modern trends in life carry a range of advantages and many disadvantages. The rapid pace of life, everyday stress, caused by every man needs for relaxation, peace, the desire for a view of the reassuring picture of green landscape, the thought of the gurgling river, scream a lark, something that will return it to its roots, refresh with new power to go back into the maelstrom of life in an urban setting. Serbia offers excellent opportunities for developing rural tourism. The fact that this form of tourism a priority in the Strategy of Tourism of the Republic of Serbia, says that the state recognized the importance of rural tourism to revitalize rural areas. Specifically, rural tourism throughout the country, especially in economically disadvantaged and less developed areas, such as municipalities Petrovac na Mlavi, can have multiple positive effects not only on individual rural households, but also the overall development of rural space.

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Economics of agriculture
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RURAL TOURISM AND ITS IMPACT ON RURAL DEVELOPMENT IN SLOVENIA

Matej Bedrač¹

Abstract

The paper describes the role of rural tourism in a wider rural development policy concept. In the first part is presented a brief historically overview and current state of development of tourist farms in Slovenia. In the second part is presented SWOT analysis concerning rural tourism which is founded on an analysis of the 33 Local Development Strategies. The paper completes with an analysis of measures that contributes to the development of tourism on rural areas and which are implemented under 3rd and 4th axis of Rural Development Programme of Slovenia in the period 2007-2013.

Key words: Rural tourism, Tourist farms, Rural development

Introduction

Slovenia is one of the most diverse European countries with above average share of rural areas. It lies on the junction of Alpine, Mediterranean and Panonian landscapes which contributes to great relief and cultural diversity. The relatively unfavourable natural conditions result in a large number of small settlement and specific land use structures.

Slovenia has small average size of agricultural holdings (6,5 hectares) and unfavourable natural conditions for an intensive agricultural production. More than 75% of total area is considered as Less Favoured Areas. These are the main reasons for the low level of productivity and specialisation in agriculture. More than 70% of agricultural holdings are operating on a part time basis and average labour input is 1,1 Annual Work Units per holding.

One of the ways for improving low labour productivity is to generate a non agricultural income for agricultural holdings through the supplementary economic activities on the farm.

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According to the data from farm Structure Survey in 2007, about 4% of agricultural holdings were diversifying in other economic activities. The prevailing supplementary activities on farms are machinery services, food and wood processing and rural tourism.

According to Bojnec (2004) different concepts have been developed on definition, relations and distinction between rural tourism, agro-tourism and farm tourism. Different traditions, in rural areas and different patterns in tourism development have caused these differences. Farm tourism is either defined as a sub-kind of agro tourism, while agro tourism is often considered as a rural tourism which is closely related to agriculture. Bojnec concludes that farm and agro-tourism usually represent only a small part of rural tourism.

Tourism offers employment opportunities for farmers and family members who are looking for employment outside of agriculture. The economic advantages of agro tourism for agriculture arise from:

- Direct sales of farm products to tourists without any transport and marketing cost
- Increased employment opportunities, especially for women and young people
- Generation of supplementary farming activities which affects positively on the quality of farm tourism services

Tourism is one of the most important economic branches and their importance in Slovenia increasing. It is estimated that tourism contributes 12% to GDP and employs more than 50.000 people.

In 2001 was prepared Strategy of Slovenian tourism 2002-2006 where are presented basic guidelines of the development of Slovene tourism and the development of rural tourism is one of its basic orientations. The main goals in the field of rural tourism in that period were:

- Developing an integral tourist offer in villages and new tourist farms
- Stimulating marketing activities in the framework of tourist agencies and continuing domestic and international promotion within Slovene Tourist Farm Association and Slovenian Tourist board.
- Establishing relations between the development of rural tourism on farms and European pre-accession assistance programmes (SAPARD)
- Setting up a register of tourist farms and connecting them into an integral tourist information system at the national level.

Some rural areas of Slovenia, such as Gorenjska and the Upper Savinja valley have a long tradition of rural tourism, going back to nineteenth century and which by 1930s was well established. After Second World War tourism in rural areas stagnated because of the efforts were redirected to the development of mass tourist resort in coastal and mountainous areas. In the late 1970s government started with the incentives for mountain farmers and try to secure additional income. Agricultural advisory service trained special advisors for supplementary activities and work for farm families. Over the last 25 years various forms of agri tourism have expanded slowly across Slovenia, primarily to provide secondary source of income for family farms (Verbole, 1997).

Tourist farms in Slovenia

Tourist farms represent the base of rural tourism in Slovenia. There are currently registered 630 tourist farms of which 228 have accommodation capacities, 218 are excursion tourist farms, 94 wine shops and 27 osmicas (makeshift restaurants). In total Slovene farms have more than 26.000 seats and over 3.000 tourist beds.

Tourist farms offer very diverse forms of accommodation. Guests can chose between stationary tourist farms with bad & breakfast, half board and full board accommodation or excursion tourist farms which are generally open only on the weekends. Other forms are wine cellars, and in recent years very popular campgrounds.

Tourist farms still provide relatively inexpensive holidays. The average prices per person per day ranged between 12 € in self catering homes and 29 € for a full board accommodation.

Table 1: Average prices/per person /per day on tourist farms in Slovenia

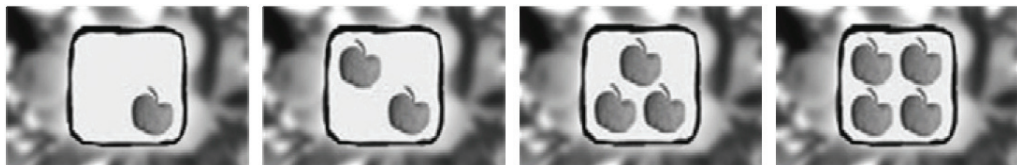
	Basic quality (1-2 apples)	Medium quality (3 apples)	High quality level (4 apples)
Rooms/ Bad & Breakfast	17 €	20 €	24 €
Rooms/half board	20 €	24 €	29 €
Self catering homes	12 €	15 €	

Source: Association of Tourist farms of Slovenia

The average occupancy rate on tourist farms in 2009 was 85 days while the farms which are near tourist centres had occupancy rate more than 150 days. In the period 2002-2009 the average occupancy rate almost double. Majority of guests are form Slovenia (60%), Germany (13%), Italy (12%) and Croatia (8%).

A quality grading and classification scheme are obligatory for all tourist accommodations in Slovenia. The quality of accommodations and services on tourist farms for rooms and apartments is ranked from one to four apples. One apple means simply furnished rooms with a common bathroom and toilet. Two apples mean furnished rooms and at least half of them have en-suite toilet and bathroom. Well furnished rooms and majority with bathroom and toilet ar graded with three apples. Four apples have large and comfortable well furnished rooms with en –suite bathroom and toilet, a wide offer of meals and different additional facilities such as tennis court, swimming pool, riding and other activities. The quality signs are presented on picture 1.

Picture 1: The quality signs of tourist farms



From 2007 the Agricultural chamber of Slovenia granted quality signs for holiday themes, because there are increasing number of tourist farms in Slovenia that have chosen to develop specialized offer. Experts from various fields have prepared different obligatory and optional conditions that farms must fulfil, if they want to obtain a holiday theme sign. Holiday theme signs are presented on picture 2.

Picture 2: Holiday theme signs of tourist farms



The farmers may promote their tourist farm as:

- Ecological tourist farm,
- Tourist farm with healthy lifestyle offer,
- Family friendly tourist farm,
- Tourist farm with programme for children unaccompanied by parents
- Bicycle friendly tourist farm
- Winegrowing tourist farm
- Disabled persons friendly tourist farm

Among the farms which are listed in the catalogue of Slovene Tourist Farm Association almost one quarter of agricultural holdings are represented as ecological tourist farms, while other holiday themes are represent in a lesser extent.

There are two possibilities for setting up tourist farm. Tourist farm can be organised as a supplementary activity on agricultural holding and second option is that holder establish tourist farm as private entrepreneur. If they have supplementary activity on a farm, they have some limitations. They should have maximum 10 rooms and 60 seats. Income earned from supplementary activities per family member should not exceed 1,5 average yearly earnings per person in paid employment. If the farm is situated in the less favoured areas for agricultural production, income should not exceed 3 average yearly earnings. They also have to fulfil minimum education and hygiene standards for production of food. If the farmer is private entrepreneur farm tourism has to operate under the same conditions as in any economic activity.

The biggest difference between tourist farms and other tourist activities such as restaurants, inns and hotels is tax treatment. Taxation policy can provide considerable incentives or disadvantages for private business development, including tourism on a farm. This considers personal income tax treatment for tourist farms and for value added tax rates. The tax rate in Slovenia is 25%, but provides two different tax bases. The tax base is determined as a difference between realised income and normative costs in the amount of 70% of realised income. There is also a possibility that person who runs the business can decide on bookkeeping system. In such case, the tax base is

determined by deducting the actual costs from realised income. Furthermore, the Value Added Tax is obligatory for all businesses where an income exceeding 42.000 € per year. All others, especially the self-employed or farmers with supplementary activity can decide upon this system voluntarily. According to Slovenian personal income tax treatment the taxes for tourist farms are more favourable than for other purely tourist activities such as inns or hotels. This different treatment creates conflicts between inns and tourist farms, and some bankrupted tourist farms aim to convert themselves into inns, but register as tourist farms (Sebenik, 2004).

Tourist farms are gathered in the Slovene Tourist Farm Association. The association was established in 1997 and now has more than 340 members. The main activities of the association are related to promotional activities and training for their members. In the cooperation with the chamber of agriculture organize different courses. The association together with Slovenian Tourist Board (www.slovenia.info) each year published catalogue Friendly countryside. Catalogue is published in English, German, Italian and Slovene language and the publication of the tourist farm with its photo and short presentation costs around 100 €.

Slovenian tourist board also promotes other activities which are connected with rural tourism and rural areas such as wine routes, wine cellars and different heritage and theme trails.

SWOT analysis

Under the 4th axis of Rural Development Programme Slovenia implements local development strategies which are based on endogenous development potentials and active role of local communities. Development of tourism is an important part in every local development strategy. We have made SWOT analysis concerning rural tourism which is founded on the analysis of 33 local development strategies. Swot analysis is presented in the tables 3. and 4.

Table 2: Strengths and weaknesses in the field of rural tourism

Strengths	Weaknesses
<ul style="list-style-type: none"> - Diversity of cultural landscape and preservation of environment on the countryside Good geo-traffic position - Well established network of different tourist associations - Rich natural and cultural heritage - Local customs and traditional handicrafts - Already established theme trails and wine routes - Increased demand for accommodation facilities on farms - Already established tourist products and brands - Well developed health resort and spa tourism - Increased demand for high quality agricultural products - Established quality and control system on tourist farms 	<ul style="list-style-type: none"> - Lack of cooperation between tourist providers and farmers - Lack of specialized knowledge and skills in the field of tourism - Lack of accommodation facilities in rural areas - Unfavourable size structure of agricultural holdings - Lack of infrastructural equipment in the countryside - Poor transport infrastructure in certain regions - Less developed supplementary activities on farms - Poor education and knowledge of the staff employed in tourism

Source: Local development strategies

The main advantages of Slovenian rural areas are favourable ecological situation, rich natural and cultural heritage and biodiversity which create favourable preconditions for the development of tourism. In Slovenia are registered over 1.300 protected areas which occupy over 200.000 hectares of land and there are over 21.500 units of immovable cultural heritage.

The main disadvantages are unfavourable size structure of agricultural holdings and farmers don't have enough financial resources for investments in tourist capacities. In some remote rural areas is unfavourable age and education structure which influence on less developed supplementary activities and deficiency in specialised knowledge and skill in the field of tourism.

Table 3: Opportunities and threats in the field of rural tourism

Opportunities	Threats
- Integration of agriculture, tourism and tertiary activities	- Increased demand for high-qualified labour force in tourism and agriculture
- Establishment of integral touristic products	- Deterioration of cultural heritage facilities
- Further development and promotion of trade marks	- Complex conditions for establishment of supplementary activities
- Integration of protected areas in tourist offer	- Depopulation of rural areas
- Active and healthy leisure options in the countryside	- Abandonment of production in agriculture and thus loss of traditional lifestyle

Source: Local development strategies

Tourist providers have to continue with the establishment of integral touristic products. In some regions are already have examples good practice examples such as Heritage trail of Dolenjska and Bela Krajina which brings together more than 200 tourist providers. Slovenia has excellent opportunities for a further development of organic farming and more emphasis should be given to the production of specialized agricultural products.

Lack of other employment possibilities outside the agriculture and poor traffic infrastructure causes depopulation of rural areas. Especially in the remote region this could lead to the abandonment of agriculture production and overgrowing of agriculture land.

Rural tourism and rural development measures

Ministry of Agriculture, Forestry and food supports investments in tourism capacities and recreational areas on farms. During the pre-accession period Slovenia start to stimulate economic diversification on the farms and improvement of infrastructure on the countryside. The funds were devoted to investments on tourist farms with accommodation facilities, excursion tourism and handcraft. The investments were used for reconstructing old farmhouses, new construction and equipment activities for farm tourism. During the whole programme period were carried out 85 investments in the

total value 5,5 millions €. The co-financing rate was around one third of the total value of investment.

After the accession to the European Union similar measures were carried out in Single Programming Document 2004-2006. For the measure Diversification of agricultural activities and activities close to agriculture were spent 10,6 millions € for 201 investments. Funds were devoted for establishment small processing units, building of tourism capacities, workshops and exhibition and sales facilities. The investments had positive impact to the quality of living and preservation of cultural heritage.

Within the Rural Development Programme 2007-2013 Slovenia continues with investments in tourist capacities in frame of 3rd and 4th development axis. Measures within 3rd axis are aimed in improving the quality of life in rural areas and promoting economic diversification.

For the measure "Diversification into non-agricultural activities has been approved in the first three years of the implementation 143 applications in the total amount of 13 millions €. More than half of the approved applications were devoted for investments in tourism.

Village renewal and development is another measure which contributes to the development of tourist infrastructure. By the end of 2009 were approved 22 applications in total amount nearly 7 millions of €.

For the measure "Conservation and upgrading of the rural heritage applicants may obtain support for the reconstruction of cultural and ethnological heritage. By the end of 2009 were approved 34 applications in total amount 1,5 millions of €.

In the years 2008 and 2009 were under the 4th axis approved 396 projects in the total amount over 12,2 millions €. The average co-financing rate from the European Rural Development Fund is 48%. Half of the projects directly contribute to the tourism development in rural areas.

Conclusions

Tourist farms in Slovenia are very well organized and they complement touristic offer in rural areas. In the last years they established quality and grading system as well as segmented their offer in accordance with different holiday themes. They are putting great effort in promotional activities and their occupancy rate in the last seven years more than doubled.

Based on the SWOT analysis and the study of existing literature we may conclude that rural areas offers various tourist attractions as well as already established products and services. The biggest problems are dispersed tourist offer, lack of adequate tourist infrastructure and lack of cooperation between different stakeholders and interest groups.

Unfavourable size structure of the Slovenian farms and low level of education hinder the future development of tourist farms. A lot of Slovenian farms are too small and despite of substantial financial support which is available within the measures of 3rd axis of Rural Development Programme, don't have enough financial resources for investments.

At the end we may conclude that diversification of activities in the field of tourism and cross-sectoral partnerships represent development opportunity for rural areas in Slovenia.

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RURAL POPULATION – FACTOR OF DEVELOPMENT OF TOURISM IN VOJVODINA

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Abstract

Rural areas in Vojvodina record negative demographic indices that refer to population growth, as well as to age, gender, and educational structure of population. This has negative impact on quantity and quality of human resources, and through them on possibilities of development of tourism in this area. In addition to that, there is also an evident problem of lack of motivation of the population for dealing with this form of tourism. The reasons for insufficient interest of the population should be looked for, primarily, in inadequate education.

Key words: *rural tourism, human potentials, demographic changes, education, motivation.*

Introduction

Nature does represent the main resource for development of rural tourism, but human resources are its main driving engine. Natural attractiveness of rural areas of Vojvodina is a necessary and indispensable condition for development of tourism, although it is not sufficient. The process of development of tourism requires the activation of all available resources, in particular of human resources.

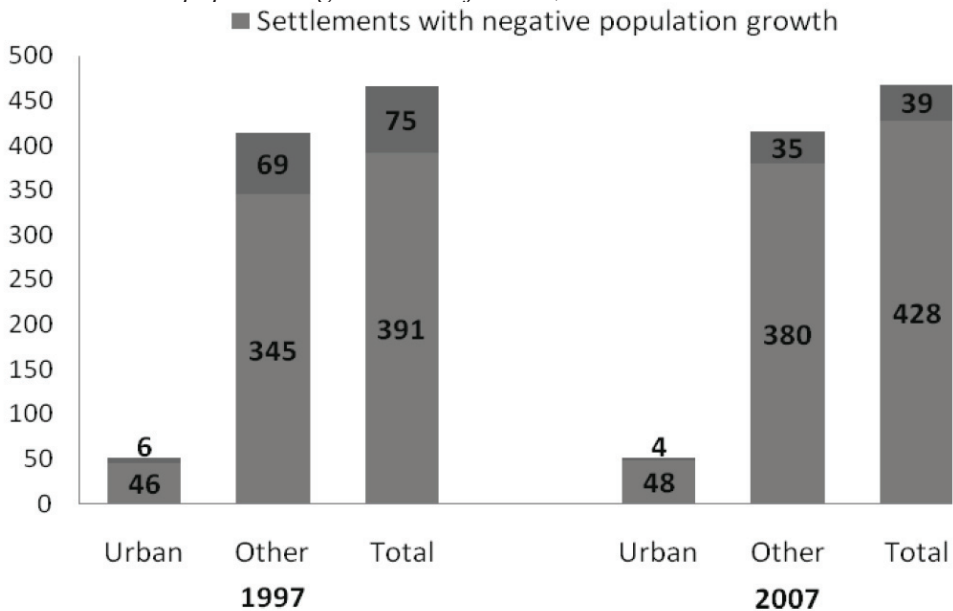
Human resources in the function of development of rural tourism in Vojvodina are **the subject of study in this paper. The objective of the paper** is to propose measures for enhancing of the existing resources in this field. The authors use method of analyses of human resources and comparison of available data in different periods of time. The publications of the Statistical Office of the Republic of Serbia are used as the sources of data.

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Demographic changes and human potentials in Vojvodina

According to the Census from 2002, Vojvodina had 2,031,992 inhabitants who lived in 45 municipalities and 467 settlements, 52 of which are urban and the remaining 415 are rural settlements. Although the data of the Statistical Office of the Republic of Serbia point to the trend of slight increase in number of inhabitants in the territory of Vojvodina in the period from 1921 to 2002², rural areas record negative demographic indices. Beside this fact, negative tendencies are also illustrated by the data on the number of settlements in Vojvodina with negative population growth figures³ (figure 1):

Figure 1: Total number of settlements and number of settlements with negative population growth in Vojvodina, in 1997 and 2007



Source: *Statistical Yearbook of Serbia 2009, Statistical Office of the Republic of Serbia, adapted by authors*

Based on the data presented in the figure 1, it is obvious that a large number of settlements in Vojvodina record a significant demographic loss, namely a larger number of deceased persons compared to the number of live born. The percentage share of

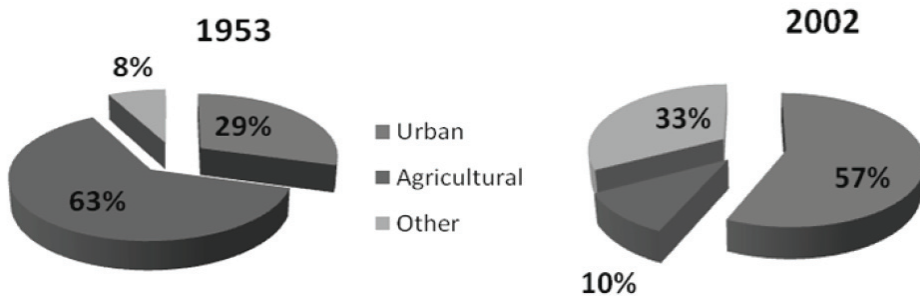
2 Except for the period from 1981 to 1991 when decline in the number of inhabitants was registered, as it was confirmed by the Census from 1991. However, the latest Census from 2002 points to renewed increase that is explained by a large inflow of refugees into the territory of Vojvodina. Source: Statistical Yearbook of the Statistical Office of the Republic of Serbia, 2009.

3 The difference between the number of live born and number of deceased persons.

other (rural) settlements with negative population growth accounted for 83.3% in 1997 and 91.6% in 2007.

Based on the available statistical data⁴ for the period from 1991 to 2002, it can be concluded that a significant number of other (rural) settlements in Vojvodina recorded a decline in number of inhabitants (260 out of 415 settlements, which makes 62.7%). This phenomenon is less expressed in urban settlements. Moreover, a significant number of urban settlements recorded increase in number of inhabitants (31 out of 52 settlements in total, which makes 59.6%). Statistical data show that significant changes in the structure of population happened in Vojvodina in the second half of the 20th century through internal migration streams leading from rural to urban settlements. For example, according to the data of the Statistical Office of the Republic of Serbia, the share of urban population in Vojvodina was 29.5% in 1953, while it reached 56.7% in 2002 (figure 2).

Figure 2. Share of urban and agricultural population in the total number of inhabitants of Vojvodina, in 1953 and 2002



Source: *Statistical Yearbook of Serbia 2009*, Statistical Office of the Republic of Serbia, adapted by authors

Contrary to urban population, the share of which in the total population increases year in year out, the share of agricultural population records constant decline. Such trends are the consequence of industrialisation and urbanisation that have been in progress after the World War II. The share of agricultural population in Vojvodina accounted for 62.9% while in 1953 it accounted for only 10.6%. The consequence of such population policy is that “people do not have what to do and where to live in towns and cities today, while there are no people who would and settle in villages“.⁵

The insight into the situation with human potentials in Vojvodina is not possible to acquire without the analysis of the population structure, referring to age, gender, and educational structure.

4 Statistical Yearbook of the Statistical Office of the Republic of Serbia, 2009.

5 Tomic, D. (2008): “The future of rural areas in Serbia- and the world to me”, Agriculture and rural areas, Belgrade, p. 65

Table 1: Age and gender population structure in Vojvodina, 2002

Age in years	No. of inhabit.	% of share	Male	% of share in the total male population	Female	% of share in the total female population
Under 15	322214	15.86	165337	16.79	156877	14.98
From 15 to 64	1386031	68.21	689589	70.01	696442	66.51
65 and older	315185	15.51	125964	12.79	189221	18.07
Unknown	8562	0.42	4052	0.41	4510	0.43
Total:	2031992	100	984942	100	1047050	100

Source: *Statistical Yearbook of Serbia 2009, Statistical Office of the Republic of Serbia*

According to the data presented in table 1, it can be seen that the largest share in the structure belongs to the population aged from 15 to 64 (68.21%). The share of population aged under 15, as well as of population aged 65 and over makes 15%. However, the fact that the share of population older than 65 rises in rural areas of Vojvodina raises concern. The recent researches show that the least favourable situation is in municipalities of Nova Crnja, Alibunar, Secanj, Zitiste, and Plandiste.⁶ Those data show that neither Vojvodina nor Serbia⁷ are exempted from the process of population ageing, which commenced in Europe long time ago, in particular new EU Member States EU (10+2)⁸. Those negative changes in age structure of the population do not contribute to the development of rural tourism since younger and middle-aged population represent the future of development in this field.

The analysis of gender structure of the population is not less significant than the age structure, having in mind that rural tourism represents the activity within which the female workforce is very important. Therefore, more significant share of the female population belonging to the age group from 15 to 64 represents a good basis for the development of rural tourism. According to the data for 2002, the share of this age group of the female population in the total female population was 66.51%, and it the

6 Njegovan, Z., Pejanovic, R. (2009): "Rural reorganization of Vojvodina", University of Novi Sad, Faculty of Agriculture, p. 140.

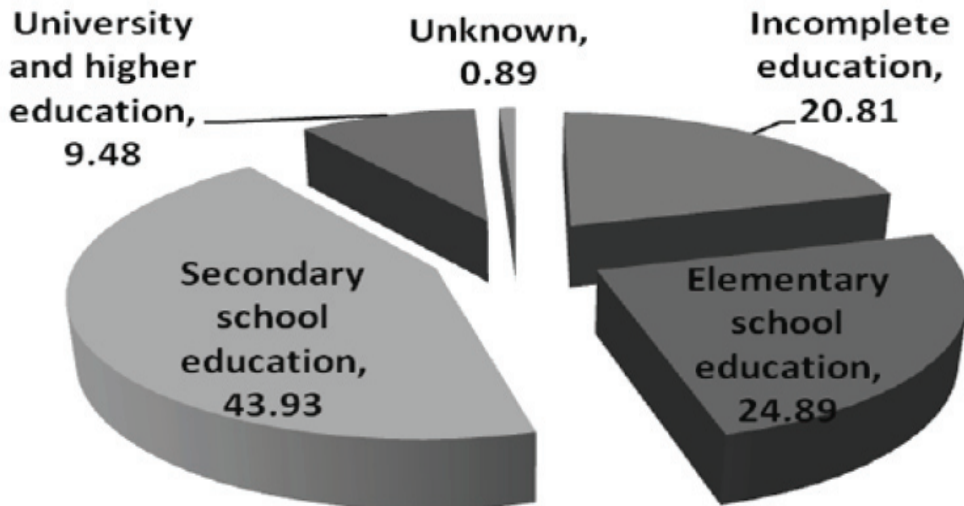
7 This is confirmed by data on average age of the population and ageing index of population of Serbia (the ratio between old (60+) and young (0-19) population): average age in 1953 was 29.4 years and ageing index was 24.1%, while in 2007 the registered average age of the population was 40.9 years and ageing index was 103.2%.

8 Csaki, C., Jambor, A. (2010): After the First Five Years: The Diversity of Effects of EU Membership on Agriculture in New Member States, chapter in monograph: Agriculture in Late Transition: Experience of Serbia, DAES, Belgrade, p. 37.

total population of Vojvodina it was 34.27% (data from the Table 1).

In addition to the above-mentioned, it is also important to analyse the educational structure of the population since it represents a significant quality indicator of human resources (figure 3).

Figure 3: Educational structure of the population older than 15 in Vojvodina, 2002



Source: Statistical Yearbook of Serbia 2009, Statistical Office of the Republic of Serbia, adapted by authors

The survey of data from the figure above shows that the largest share belongs to the population with secondary school education (43.93%), while the share of the population with elementary school education accounts for 24.89%. The share of the population with university and higher school accounts for 9.48%. However, there is a significant number of inhabitants of Vojvodina with incomplete education (355,766 inhabitants, or 20.81%).

In rural municipalities of Vojvodina, there is a lower share of educated population compared to urban municipalities. Recent researches show that Zrenjanin and Vrbas are rural municipalities in Vojvodina with the most favourable education structure, while the situation in municipalities of Zitiste, Kovacica, Alibunar, and Bac is the least favourable.⁹ The unfavourable educational structure in rural areas is most often explained with the impact of factors such as leaving of young people to urban centres, unfavourable age structure, limited education opportunities, etc. This phenomenon cannot be evaluated positively and it should be paid more attention in the future.

Positive changes in all of the population structures of Vojvodina analysed above

⁹ Njegovan, Z., Pejanovic, R. (2009); "Rural reorganization of Vojvodina", University of Novi Sad, Faculty of Agriculture, p. 145.

could undoubtedly stimulate the development of rural tourism in the future. However, the data that only 7 out of 415 rural settlements in total have developed some forms of rural tourism points to another limiting factor – *lack of motivation* of the population.

Motivation and education in the process of human resources activating

Motivation is of crucial significance in the process of activating of the rural population. Higher motivation and higher quality education of the population would eliminate one of the main barriers in the development of rural tourism. It is of exceptional significance in that complex process to identify primarily the factors that can affect higher motivation of the population. Education of the population singles out as one of the most significant. Specialised references often mention the significance of education as one of the key factors of further development of rural tourism.¹⁰

Education of the population should represent the basis of all the activities related to human resources as factors of development of rural tourism. Absence of interest and insufficient level of skill among the population are largely conditioned by their insufficient education.¹¹ That is why it is necessary to ensure that all interested households have access to appropriate education and training, knowledge and skills that are necessary for providing of satisfactory quality of services in rural tourism. *Education should offer the replies to the questions such as: How to start up, manage and develop rural “business“? Answers are important because the determinant factors of the tourist competitiveness of each region are the development and operation of the management system with the effective, suitable competences and calculable financing and organisational background.*¹²

The contents of education should include the following topics:

- *Potential positive effects*
- *Possibilities for obtaining of initial funds*
- *Rural “business“ management*
- *Preservation and development of rural areas and the environment.*

In this phase of development of rural tourism in Vojvodina, which means at its very beginning, the benefits from dealing with this industry are not visible. This fact aggravates significantly the process of motivating the population. That is why it is necessary, in particular in this stage, to *educate the population about potential positive effects* that can be expected from rural tourism. The emphasis within the education

10 Todorovic M., Stetic S. (2009): “Rural Tourism“, University of belgrade, Faculty of Geography, Belgrade.

11 Bošković Tatjana, Andrić, Nataša, Tomić, D. (2010): „The human and financial resources- factors in rural tourism in Vojvodina“, Scientific Symposium „The village and tourism in Vojvodina“, 03 and 04 June 2010 Velika Plana (oral presentation)

12 David, L., Anett Tozser (2009): Destination management in Hungarian tourism, Applied Studies in Agribusiness and Commerce – APSTRACT, Agroiinform Publishing House, Budapest, Vol. 3, Numbers 5-6, p. 82.

process should be placed on some of the most significant effects that could have the effect of driving engines when it comes to rural population. Having in mind a difficult economic position of the population in this region, the possibility to accomplish supplementary revenues with the minimum investments is the effect that should be emphasised. The significance of expanding of this activity onto peripheral areas based on inter-dependence of agriculture and tourism should be advocated intensively.

In addition to getting acquainted with potential benefits from the development of rural tourism, it is also very important to get informed about different *possibilities for obtaining of initial funds*. Despite the fact that rural tourism provides possibilities of generating additional revenues with the minimum investments, due to a difficult economic status of the population the initial funds are often insurmountable obstacles for many interested individuals. It is necessary to inform them about the institutions that grant funds for such purposes, as well as about the latest competitions for fund granting. It is also necessary to provide all practical assistance related to preparation of documentation that is to be submitted along with the applications for competitions.

When it comes to *financial support provided by the state*, it should be pointed out that since 2006 the Ministry of Agriculture, Forestry and Water Management has allocated funds for renovation of traditional rural households, as well as for promotional and educational activities.¹³ Out of the total amount of funds that were spent in Vojvodina, 84.36% were invested into renovation of traditional rural households and 15.64% in promotional and educational activities. Based on previous researches¹⁴ it can be seen that during a three-year period the amount of funds that were spent is smaller compared to the funds that were approved for those purposes. The reasons could be found in inadequate information, as well as in unprofessional preparation of tender documentation.

Successful *rural "business" management* requires serious approach and application of knowledge and skills in different fields. The offer has to be attractive in order to attract tourists from the country and from abroad. It has to be taken into account that rural tourist is simultaneously an active tourist, namely hobbyist¹⁵ who demand quality in terms of accommodation, meals and offered contents. It is very important that future entrepreneurs in rural tourism obtain primarily all necessary skills and knowledge through training (in the fields of management, marketing, etc.) related to fulfilment of

13 In the period from 2006 to 2008 the total amount of 91,580,215 RSD was allocated and spent for those purposes, 12,164,271 RSD of which, or 13.3%, were allocated and spent in Vojvodina.

14 Boškovic Tatjana, Andric Natasa, Tomic, D. (2010): "The human and financial resources – factors in rural tourism in Vojvodina", Scientific Symposium „the village and tourism“, 03. i 04. June 2010. Velika Plana (oral presentation).

15 Andric Natasa, Tomic, D., Tomic Gordana (2010): Status and Perspectives of Development of Rural Tourism in the Autonomous Province of Vojvodina, 118th EAAE Seminar "Rural development: governance, policy design and delivery", Ljubljana, 25-27 August 2010, p. 614

“administrative“ part of their business as well as knowledge that will help them in setting up of good communication and relations with their guests. The latter are considered as those of the highest significance in tourism industry and those that a long-term survival and development of rural “business“ depends on up to a large extent.

In the end, it is very important to emphasise the significance of *preservation and development of rural areas and the environment*. The attractiveness of rural areas for development of tourism is reflected in preserved environment and rural heritage and culture. Natural resources are the basis for development of rural, as well as all other forms of tourism. Only clean and unpolluted environment can be the basis for successful dealing with tourism. Therefore, it is necessary to develop a high level of ecological awareness and invest efforts in obtaining the support and assistance from the local population in environmental protection activities.

Taking into account the conclusion of the International Conference that was held in Riga, which states that obstacles in training of entrepreneurs in rural tourism include primarily the lack of time and motivation, and taking into consideration the conditions and way of life of rural population in Vojvodina, education should be carried out:

- *“From village to village“*
- *Completely free of charge*
- *During the periods that are not the season for agricultural works*
- *In a professional way.*

The objective of such education method is to provide *high quality knowledge (training) with the minimum of time and investments* by the future entrepreneurs in rural tourism.

Conclusion

Human potentials, although being significant, are not a driving engine, but rather the barrier in the development of rural tourism in the territory of Vojvodina. Therefore, a special attention should be paid in the future to enhancing of human resources. Education of all the participants in the process of development of rural tourism should be a significant part of those activities. The education programme should include rural households that participate directly in creating and providing of tourist products and local communities as indirect participants. The future development of this industry will depend on the support of the state, which has to be much stronger and active than it has been the case until now.

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Economics of agriculture

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LEGAL ORGANIZATION OF CYCLING, THE OPPORTUNITY TO DEVELOP AGRO TOURISM IN ROMANIA

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Abstract

Presently, the Ministry of Tourism is under way to promote a law to introduce in our country as well a form of tourism successfully practiced in western countries, namely the cycling tourism. One can state that cycling tourism is even nowadays practiced in Romania, but on an un-organized basis and on routes that are not homologated. The development and promotion of this form of tourism can provide to some rural and agricultural pensions in the country new possibilities for attracting customers, due to the fact that tourists going on cycling tours will need hosts to rest and taste the traditional Romanian food.

Key words: Romania, cycling tourism, agro-tourism, legislation

Introduction

In this paper, we wish to investigate the adoption of legal regulation on cycling in Romania and the ways such a project can lead to the development of agro tourism in our country. Currently, the Ministry of Tourism wants to promote a bill to introduce and regulate in our country a form of tourism practiced with great success in Western countries, cycling tourism. This type of tourism exists already, of course, but it is unorganized and there aren't any approved routes.

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Background and existing infrastructure

The development and promotion of this form of tourism will be for some rural and agro hostels in the country new opportunities for attracting customers, because tourists will be bike paths hosts and will need to rest and to taste traditional Romanian food. We consider agro-tourism as a narrower concept, while integrated rural tourism and tourism refers to all services related and charged directly to peasant households. Term accommodation and tourism activities is aiming at leisure in peasant households, together with the hosts, so this concept aims at providing services of accommodation, dining and entertainment in the household and in close connection with them.

The rural tourism is the need to create accommodation, while the farms will be used as tourist sites of deployment of the service. Agro-tourism as a particular form of rural tourism must be practiced by farmers and householders as a secondary activity, while agriculture remains the main occupation and source of income. The Mountain Area Commission in Romania, under the organization and development of tourism in the mountain area, defines agro-tourism as follows: a particular form of rural tourism, more complex, encompassing both the tourism industry itself: accommodation, hostel, tourist service, the programs, and additional basic services and economic activity, usually agriculture, practiced by the hosts of tourists (productive activities for obtaining and processing of agricultural products in the household and their sale to tourists, or commercial networks, and house leisure).

Within the concept of sustainable development, agro-tourism becomes the factor that is contributing to the preservation of rural structures and lifestyles, habits and traditions. This form of tourism is a multi-activity type, it is more than staying at a farm house. Increasing interest for the natural and rational nutrition is a key attraction and is manifested more strongly in the international market, particularly in developed countries. Life in the country ensures an active rest, becoming scarcer and more expensive in urban areas. Due to the relatively small size of farms involved (often family farms), agro-tourism is better equipped to meet tourist demand for quality, privacy, originality, while the elasticity of purchased services ensure their adaptability to individual needs. Agro-tourism can help diversify and improve the local economy, increase business and employment opportunities, promotion and development of services, diversifying the use of the workforce, attracting new investments. Agro-tourism is emerging as an activity able to capitalize on existing surplus of accommodation in many households, prepared and equipped to receive guests for a period of time. It generates motivation of the householder to improve the household inside and outside, in order to obtain additional incomes; it stimulates additional concerns to develop its core activities, up to the quality standards desired by tourists.

1. In essence, agro-tourism involves a recovery of the valence top economic, natural and man of rural settlements by tourism, with the emphasis on maintaining traditional components in parallel with satisfaction of attractive modern tourism, competitive co-participation and mutual cohabitation tourist and host-guest receiver defining elements. Radu Rey appreciates that “agro-tourism is not just a factor

of economic balance, which engages many reproducible resources adjacent factors, but education is a cultural ambassador, a constant and not very expensive instrument of social progress” (*Radu Rey, 2001 Romanian Carpathians, no.5/2001*).

The performance puts in contact agro-tourism people (hosts and tourists) from all different economic and social environments and through this interaction can lead to positive developments, both among the tourists - who come into contact with other mentalities and habits, with other way of organizing life, and among the hosts who may know a number of environmental features and places of origin of tourists. Thus, by sharing information, people are coming out of rural isolation, but are still protecting its cultural dimension, the viability and stability through tourism. Agro-touristic activities must be capable of maintaining and developing agricultural activities and their substitutes, because otherwise they would lose the essence of tourism.

Factors stimulating eco-tourism development

Factors that have stimulated and stimulate tourism development, influencing growth of tourist flows are mainly: (a) increasing urban stress; (b) increasing interest in health maintenance while increasing the level of education; (c) increasing interest in authentic, traditional food; (d) fulfillment of personalized travel demand.

Ecotourism is emerging as a new form of tourism, which grew rapidly in the last decade under the label of “nature tourism”, the main feature being the strong business orientation of certain environmental principles. Tourism is practiced by small groups of people, and as a business is contributing to biodiversity conservation and is sustaining prosperity of the rural population, by means of responsible action from both tourists and the tourism industry. Ecotourism involves all tourism activities and economic development in an unspoiled environment, where economic restructuring and technical adjustments or shaping urban environmental management - undertaken for the welfare needs of the population - should not affect, in any form, the inheritance of future generations. This is why this type of tourism requires the adoption of a new behavior and tour operators, tourists and the general public, from government and nongovernmental organizations, goal achievable through: (a) environmental education to all sections of the population; (b) promoting moral and ethical responsibilities, and attitudes directed towards preserving and protecting natural and cultural environment by all agencies; (c) cultural awareness from the tourists and their participation experience.

Nature-based tourism, as a form of ecotourism, has begun to be studied by experts in development since the early 90s. In 1991 “The International Ecotourism Society” (a non-profit society with 1600 members from 110 countries) defined ecotourism as “those responsible travelers that conserves the environment and supports the development of the local population”.

In 1996, the International Union for Conservation of Nature (IUCN) considered ecotourism as trips organized by responsible persons towards the environment and tourists who enjoy and appreciate nature, elements that overlap with conservation

measures, thus limiting the negative impacts and providing social benefits and economic gains for the local population.

As a tool that helps development, ecotourism can be defined by the three principles set out under the auspices of UNEP (United Nations Administrative Council for Environment): (a) is conserving biological and cultural diversity by strengthening management systems (public and private) by increasing the value of ecosystem; (b) is promoting the use of biodiversity by generating income, jobs and business opportunities in ecotourism and related business networks; (c) is sharing benefits with local communities by attracting development and their participation in ecotourism planning and business management.

Legal provisions for cycling tourism in Romania

With a land that ranges from steep to nice and smooth, Romania offers cyclists of all categories and levels all kinds and things they can enjoy, in addition to bike paths. A magnificent view of routes offered by forests and traditional villages invites cyclists to stop quite often. Romania has a great potential for cycling in general and mountain biking in particular, due to favorable topography, varied landscape, rich cultural and natural tourist attractions. Large parts of the Carpathian Mountains are well suited for mountain biking for all levels of difficulty, from easy trails to the forest highways long ridge shifts more uneven paths and high-level differences. Almost all are open for mountain biking (the very few exceptions representing scientific or natural reservations with strict regime, border areas etc.).

Currently, the Ministry of Tourism wishes to promote a bill to regulate the cycling tourism. The main regulations included in the draft bill are presented below.

The National Network of Cycling Routes in Romania is to be established (RNTCR), encompassing all the terrestrial communication paths in Romania which are marked for the tourist bike traffic, are known as „cycling routes”. They are classified as follows: (a) the geographical extension criteria: 3 categories: national, regional and local; (b) the type of communication means used, 2 types: road type and mountain type; (c) the difficulty level criteria, 4 levels: easy, medium, difficult and expert. The surface of communication lines is asphalt or equivalent, cycling trails should be paved as the road and possibly upgraded to the mountain, to the smallest roughness in all cases, except high mountain expert cycling trails. Average and maximum slope and the difference in total and each level of ascent cycling trails are consistent with: (a) grade - rising from casual to expert, (b) type - if possible lower than those of the mountain road; (c) rank - at the national and smaller regional, local high as possible.

Mountain cycling trails of national and regional ranking should be accessible also for mountain bikes loaded with luggage, in wet weather. Cycling trails used as communication routes should have adequate width and curvature radius for two-way bicycle traffic, should be safe and comfortable, and needs to accommodate the possible presence of luggage on bicycles with trailers up to 1 meter wide. The cycling trails

that cross the roads are devoted mainly to connect tourist areas and other areas of the country, including the natural, cultural, historical sights, with each other and with large towns and communications nodes. The mountain cycling trails are able to use trails on earth roads along rivers or dams, as well as in lowland regions or in peri-urban forests. Since biking is increasingly popular, in urban areas or in villages, cycling trails routes should be chosen so as to go wherever possible: downtown (center), commercial areas, administrative areas, sites of tourist interest, green areas or even quiet residential areas. Within the cycling trails, some itineraries should be chosen without a high sinuosity, easy to follow and close to other communication means.

Cycling trails configuration should comply with the principle of continuity and straightness. Cycling trails lengths should be chosen so as to take 5-12 days for the national ranking trails, 2-5 days for the regional ranking trails, and just one day for the local ranking trails.

Cycling trails come in two styles: linear or circuit. Linear cycling trails are generally of national interest, while the circuit type is mostly of regional and local interest. Each cycling trail is assigned with a conventional sense, except for the local mountain “expert” ones. Conventional starting and ending points are assigned to the cycling trails; they coincide in case of circuit-type cycling trails. Sometimes, for long trails, there might be additional secondary starting and ending points. Nevertheless, the starting and ending points of all cycling trails should be accessible by public transport.

In Romania, all cycling trails will be eventually connected with each other and arranged in a hierarchical network corresponding to the type and rank; so that all local or regional cycling trails will usually be connected with the next higher rank. The road cycling trails of national ranking will have multiple intersections with each other and will connect with corresponding cycling trails from neighboring countries thus connecting to the international cycling trails highways including bicycle trans EuroVelo network, thus forming a national subnet where RNTCR will represent the basic structure. The starting and ending points of the national road cycling trails points will be located at state border crossings open to international or pedestrian traffic.

RNTCR will integrate with other transport networks in Romania - pedestrian, road, railway, ship, air, ensuring inter-modality, and will become a part of the national transport system.

The cycling trails number, type and rank, their density and distribution should match the territorial needs, the available resources and the necessary regulations, “populating” each area of the country, by taking into account the specific features of the area, the amount and type of local tourist attractions and number of potential users, while strictly observing the environmental protection requirements.

For identification, management and promotion purposes, the cycling trails will be assigned with appropriate topic, name, logo and information. For tagging, description and management purposes, the cycling trails may be conventionally “divided”, where appropriate, in up to three successive levels of subdivisions, sections and segments. Only commissions in the county councils will be authorized to develop new trails,

significantly amend itineraries or eliminate existing cycling trails. The very same authorities will approve changes, restoration and maintenance work on the cycling trails, and they will be opened again for use only if all the re/construction and marking operations have been completed and received.

Restricting access to a cycling trail may be ordered only temporarily by public authorities for good reason, such as repair work, disasters, special events or other circumstances that make the bicycle traffic impossible, unacceptable or dangerous. In all cases these restrictions should be announced in advance and alternatives should be provided.

In the documentation for spatial planning, tourism cadastre, passageways cadastre, tourism resource inventories etc., bicycle routes should be appropriately outlined, as required by law. The specific signs, billboards with their accessories, and the other specific elements of bicycle trails require planning; special traffic signs and information for cyclists are public property and submitted to public protection and administration.

All costs related to the design, marking, monitoring and maintenance of the cycling trails should be covered by funds from the county councils budget, and in addition, by other public or private funds, domestic or foreign, channeled through the central and/or local authorities, NGO-s, tourism operators and other stakeholders in the industry.

The use of cycling trails is free and may not be subject to payment of fees for access and transit. Bicycle routes are marked on the ground by location along the communication lines that pass cycling trail at specified intervals and at branches and junctions of a series of graphics called "bicycle markings". Bicycle markings, depending on the complexity and technical requirements, apply by painting directly onto the substrate or through signs and billboards marking the cycling trail. Bicycle markings have specific standardized design and are composed of basic graphic elements, called cycling trail signs marking; additional text and other graphical elements may be added to form five types of combinations of increasing complexity, called bookmarks for cycling trails.

Cycling trails marking signs are the icon version of road cycling using, the common signs plus the symbol "C" as a mark of individualization. Additional elements that may appear on cycling trails markings are: indicative route, route logo, the GPS coordinates of the location, proximal or main destination (together with distances), track names, sponsor logo etc.

For easy visual identification of the difficulty degree of cycling trails, their names should be placed on signs and billboards in the corresponding color code: blue for easy, red for medium, black for difficult, and yellow & black for expert. Bicycle signs should as well indicate the distances to a main and a proximal destination. The indication will be given in kilometers, rounded to km for more than 10 km distance and rounded to hectometers (100 m) for less than 10 km distance.

Conclusions

Undoubtedly, Romania has a great tourism potential and is providing multiple opportunities, unfortunately still modestly exploited as for rural tourism (agro-tourism), and ecological tourism (eco-tourism) etc.

But why not cycling? An essential part of ecotourism, cycling trips have taken quick and powerful development in Western Europe countries; there, special routes for mountain biking enthusiasts have been settled. In addition to marked trails, detailed maps and tourist information points advise on suitable routes based on their length and difficulty. Moreover, bike rental centers have been established, as well as professional guides and tours organized.

For the moment, Romania is unfortunately quite far from all this, since cycling became less and less popular during the last two decades. Even in very busy cities, there are no bicycle lanes, as a viable alternative for private and public transport, as in many other European countries (Germany, Netherlands, Belgium).

However, the natural environment offers plentiful of opportunities and the fact that in our country the network is still less arranged, is not necessarily a disadvantage and may even be an element of attraction.

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Economics of agriculture

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AGRICULTURE AND TOURISM IN SERBIA

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Abstract

In Serbia on the area of 4.1 million hectares of arable agricultural land from 15 to 20 million t of agrarian produce has been produced annually in the value of near 5.5 billion dollars. In 2009 the food export amounted to 1.94 billion dollars. Higher food production with the development of rural tourism is possible to be realised if in the rural development of Serbia would be invested 1.5 billion dollars and the region would be made known the territory without the GMOs. It is of extreme importance since 10 percent of the inhabitants in the EU or 50 million of them are for this kind of food. Thus Serbia might double its food production for three years now and its value would be seven billion dollars and in 2030 the export value would be nine billion dollars. The agriculture and tourism in Serbia are not strategic economic branches. If it would have been invested in the agriculture Serbian villages would have stopped disappearing since one fourth of near 4 600 of them is on this path.

Key words: *agriculture, healthy food, tourism and spas.*

Introduction

Food production stability of the country, production of raw materials (for the purpose of other economic branches, trade exchange with the world, social, demographic and other aspects) determine manifold importance of the agriculture in Serbia. According to it might be concluded that the agriculture, with the following activities (food and other industries) participates in the creation of the gross domestic product of Serbia, which from year to year reaches up to 30 percent and participates in the total export of the country with 25 percent!

For example, the agriculture in Serbia annually produces on average from 15 to 20 million t of varied agrarian produce in the value of 5.5 billion dollars. Apart from the annual drop in the live stock fund of two percent, total of 450.000 t of meat

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has been produced and launched on the market. An inhabitant annually consumes 43 kilograms of meat, mostly pork meat near 289.000 t whose consumption goes beyond 21 kilograms per capita. The production and consumption of the beef meat should be increased too because less than 100.000 t has been produced and only four kilograms has been consumed annually per capita. In addition, 20.000 t of mutton and 75.000 t of poultry meat has been produced annually. Now it is important to increase the number of the beef cattle because the EU annually is short of near 700.000 t of baby beef.

Serbia has permission to export 8.875 t of baby beef to the EU market annually, but in 2007 it only exported 2.200 t, in 2008 this number was only 1.700 t, and finally in 2009 only 900 t! The main reason is that there is not enough beef cattle! For example, in 1990 Serbia exported 30.000 t of baby beef to 40 countries. If we would have had enough quantities of the baby beef for the export it would secure the export from Serbia to the EU from 30.000 to 50.000 t for the next three to five decades. The current reduced livestock cattle in Serbia annually produces 1.5 billion liters of milk. In addition, in Serbia the production of wheat amounts on average 1.8 million t, of maize six million t, of potatoes one million t. Serbia produces more than 400.000 t of sugar and exports up to 200.000 t and 220.000 t is for domestic consumption and stocks. Apart from it, Serbia disposes of near 200.000 t of vegetable oil and thus near 700.000 t might be exported, then 600.000 t of plums, more than 220.000 t of apple, near 420.000 t of grape....

In 2009 the food export from Serbia was worth 1.94 billion dollars and import was worth near 1.3 billion dollars. In 2010 the export value is expected to reach two billion dollars while the import will be up to 1.5 billion dollars. However, the analysis of this export value indicates that even 62.5 percent goes to the inherited market of the former Yugoslavia, then to the CEFTA countries and the EU. There is something else: the export of raw materials for food production is our sorrow! We do export raw materials, for example, near 1.4 million t of maize annually and later on import final products (fatted cattle from Macedonia). This agrarian policy is not good and leads to the long-term crisis in the food production.

Therefore, Serbia did not do much to return its products to the former markets all around the world neither conquered the new ones. Serbia's chance lies in the non-aligned countries. It is near 170 countries with 1.7 billion of inhabitants or consumers where the annual turnover of HALAL food amounts to 650 billion dollars. Today in these countries the ministerial position are held by the people who got an education in the former SFRY which is a great chance for Serbia. The food production for the export will enable the usage of industrial capacities. They are built for the needs of the former SFRY and are used only from 15 to 80 percent.

If the Serbian Government would proclaim agriculture and tourism for the strategic activities and Serbia for the region without the GMOs, the production of food would be higher. This requires the investment of one billion dollars at least which would double the value of its production (which in 2009 amounted to near 5.5 billion dollars). If so, the food production would meet the domestic demand, reserves and the export value would be more than two billion dollars. By 2020 the development would record a substantial growth rate up to 10 percent. Thus the domestic demand would be

satisfied at higher level and the foreign exchange income would be six billion dollars. If Serbia would continue with such development pace in 2030 the export value would reach 10 billion dollars. Instead of the current 778.000 farms by 2020 Serbia would have near 350.000 commercial farms with average area size up to 15 hectares. Other small farms would have important natural production and consumption and production for the development of tourism. Then we would have the special purpose production of food for tourism (domestic and international). If it is widely known that the EU has near 500 million of inhabitants (ten percent or 50 million of them said that they want to consume the food without the GMO) then it is a good opportunity for Serbia to produce and launch such food on this market. We should not forget the fact that such food is more expensive for 30 to 50 percent than the usual food. This kind of food might be exported from Serbia and used by tourists. If we would do so, we would thus earn the foreign exchange currency on the domestic market. Serbia would become well-known brand worldwide and the agriculture would become an important business.

Powerful name needed!

The agriculture is the activity which might help Serbia create its well-known product or brand which will be competitive at the global market. The domestic brand has to be protected in accordance with the global quality standards. The Serbian Diaspora might help Serbia to launch its products on the global market which is new 4.5 million consumers at all continents! The Diaspora could be a bridge with other countries and transformer of new technologies, business experiences and guarantee for foreign investors and buyers. The capital of the Serbian Diaspora is estimated at near 60 billion dollars and if only ten percent of its capital would be invested in Serbia its economy would be recovered! This is the reason why Serbia need the powerful name on its way to the creation of its well-known brands. It has to be said that right now it is difficult to define what Serbia's real brand is. It has to be something good, well-known on the market, beautiful, often expensive and with popular name. A successful brand has to be unique, imperishable, persuasive and of good quality. Our brand has to bear **Made in Serbia** trademark when it comes to the food for the consumption by tourists.

For the tourists worldwide as well as for those visiting Serbia the most real chance to become the Serbian brand have the following products: water, raspberry, plum, plum brandy, wine, ham, cheese, cream, tobacco-cracklings, mushrooms, smoked ham from Zlatibor mountain, sour milk, burek, sudzuk, mutton, cabbage from Futog, kid's meat. There are 18 products in Vojvodina bearing „**Best from Vojvodina**“ trademark.

Tourists are interested in waters and in Serbia there are near 400 mineral springs since this production is in connection with certain regions. Only ten of them are being used.

It has been estimated that the foodstuff could be sold in the value of 500 million dollars annually on the Western market only. If only two million of Serbian people would have spent per 200 dollars monthly on our food it would save the economy of Serbia from the lethargy. If the products would be offered to the so-called „Serbian

houses“ they would buy the products and protect themselves and their identity. It would be a wise and quite return of Serbian products on the global market.

Global references

The Republic of Serbia is dominantly rural country. Near three fourth of the territory are the regions on which near half of the inhabitants live (it has circa 7.5 million of inhabitants). The Global Tourist Organization suggested that Serbia should develop the rural and spa tourism. It is not without reason. Serbia has very favourable geographic position, good climate, rich fauna and flora, wealthy culture and tradition.

Annually some 1.500 different tourist manifestations are organized in Serbia. The development of tourism and visits of tourists from all around the world would create the real picture of Serbia.

Therefore, the data showing that more than 70 percent of people starving from hungry are living in the rural areas does not refer to Serbian villages since the most visited and popular manifestations are those celebrated in the name of: bacon, sausage, bean, barbeque, cheese, cabbage and etc. All these products require new marketing approach. It is important to highlight that they are coming from Serbia where there are not GMOs, that they are prepared in the traditional recipe.

If one rural household in Serbia would have two double rooms and would be rented to foreign visitors 200 days annually for 20 euro for one full board, the income would be 16 000 euro. We have to take into consideration that a major part of expenses goes for food and beverage which our farmer makes by himself. If only 10 percent of households would deal with tourism it would be additional income for Serbia in the amount of 1.6 billion euro annually! A great number of villages in Serbia possess spas too. A number of households is getting bigger and bigger year in, year out and there are 600 of them dealing with this kind of tourism.

A country of spas

On the territory of Serbia there are near 70 spa and climate sites and near 400 hundreds of mineral or thermal springs. Thanks to this wealth Serbia could be given the name – country of spas. If Serbia would have used this wealth in tourism it would consume the food in its best way. It would be of great advantage because the food would not be exported as raw material but as the product from the advanced processing phase. These spas and other rural tourism capacities in Serbia are not used at their maximum. (There are near 4 600 villages without the Kosovo and Metohia Province).

The historical data and archaeological researches indicate that the Roman people were the first who started visiting spas on the territory of Serbia. Upon the wars in Dacia, Roman legionaries and veterans had come to spas “to be cured, and

to get rest". Archaeological relics proved that the Romans visited spas. For example, in the middle of the bed of Crni Timok river running down Gamzigrad Spa there are baths where the Romans had bathed. It happened that even the Roman Czar Gallery who erected beautiful building Felix Romuliana had come to have a bath here. During the authority of the Nemanjić dynasty, people visited spas. The Nemanjićs, who were wise people, had taken their wives to the spas in order to show to the princesses from Byzantine, Hungary and France what Serbia has. After the reign of the Nemanjićs, Serbia was under the Ottomans. Nevertheless, despite of not being free the Serbian people had remembered the locations of thermal springs.

Crisis in tourism

In 2008 the spas in Serbia were visited by 366.098 guests and thus were realised 2.36 million of overnights. In the European bulletin 2009 Serbia is the only country mentioned as the country which in the first seven months of the previous year with 371.463 visits of foreign guests recorded a growing rate by seven percent more if compared with the same period in 2008. In the category of towns the foreign guests in that period have realised in Belgrade 501.228 overnights which is by three percent more in relation to the same period of the previous year. On the second place in the category of towns takes Novi Sad with 23.316 foreign guests. The greatest number of visits was recorded in the „queen of spas“ Vrnjačka Spa, then in Sokospa, Niška Spa, Arandjelovac, Mataruška Spa, Spa Koviljača, Prolom Spa, Gornja Trepča Spa, Vranjska Spa...

The international guests mostly visited Vrnjačka Spa and in the previous year 122.289 international guests visited this spa.

However, the global economic crisis which hit Serbia influenced the development of tourism too. Thus, in Serbia in the first seven months 2010 there were total of 747.349 domestic guests, which is by 10 percent less if compared to the same period of the previous year, while there were 366.222 international guests, which is by one percent less than it was in the last year. In 2010 the income of tourism is expected to reach one billion dollars.

They had furtively bathed and drunken mineral remedial water there. At the beginning of the 19th century Serbian people had raised the mutiny against the Turks and in the second half of the same century Serbia was released and started to recover. The spas were recovered and reconstructed in accordance to those from Europe. Some Serbian spas were of high rank because the eminent gentlemen bathed in them. At that time such were spas and their guests. The spas in Serbia were improved a lot between

two world wars. It is interesting that then there were more guests in Vrnjačka Spa than in Dubrovnik although it was known as elite tourist destination. Branislav Nušić sang a song: "Sokospa, Soko Town rejuvenates you" It is true. Ivo Andrić used to say that it was enough to spend three weeks or 21 days in Sokospa and you could work the whole year. These examples depict and illustrate the opinion that spas refresh people and reduce the stress at these modern times. The health of the guests in spas is being improved through the wellness centers.

Privatization in tourism

When it comes to the privatization in tourism in Serbia, all hotel-tourist enterprises have been sold via auction in the following spas: Mataruška, Bogutovačka, Soko, Koviljača, Bukovička. The privatization of the Fontana hotel in Vrnjačka Spa has been annulled and new privatization process is expected to be carried out again. Gornja Trepča near Čačak is an example of good privatization. It is reconstructed and five times more money invested in. In 2009 total of 3.2 billion RSD was allocated from the budget to tourism sector.

After the WWII in Yugoslavia and in Serbia the most important was the so-called working class of people. The spas were turned into health resorts devoted to the working class. And what then happened? The guests reflected the spas. The spas were poor. During the authority of Tito the politicians spent their holidays on the Adriatic Sea. The spas were neglected and left to deteriorate. Upon the latest wars conducted on the territory of Serbia the spas went through transition. From 2000 and onwards the spas started recovering and the opinion on them changed. They were not any more just the health resorts, sanatoriums, but people started visiting them to refresh their body and soul. As the best example may serve the data that in 2008 the number of overnights increased by 11 percent and in some places more than by one hundred percent!

However, the global economic crisis hit tourism in Serbia too. According to the data obtained from the Republican Statistics Office, in Serbia in the period January – July 2010 there were ear 1.1 million tourists which is by seven percent less in relation to the same period, but the reduction mostly refers to the number of the domestic guests. In the first seven months 2010 in the country stayed 747.349 domestic guests which is by 10 percent less if compared with the same period of the previous year. On the other hand, there were 366.222 international guests which is by one percent less than it was in the same period of the last year. The domestic tourists mostly stayed in the main administrative centers (133.697), spas (177.601), on the mountains (202.505) and in other tourist destinations (202.967). The international guests in Serbia visited main administrative centers (230.748), other tourist destinations (83.499), mountains

(24.556). In the period January – July 2010 it was realised 3.6 million overnights, which is by 15 percent less in relation to the same period. Out of total number of overnights the domestic tourists realised near 2.8 million or 15 percent less if compared to the same period of the previous year and the international guests realised 780.927 overnights or 13 percent less in relation to a year ago. Observed by the number of overnights, the domestic guests mostly stayed in spas (40 percent), and on the mountains (30 percent), while the international guests stayed in the main administrative centers (60 percent) and other resorts (20 percent). The highest number of overnights in the first seven months 2010 when it comes to the international guests realised the guests from Bosnia and Herzegovina (81.690), and the least number of overnights was realised by the tourists from Austria (25.338).

There is still a lot to be done. As soon as the Law on tourism was adopted which is harmonized with the Global Tourist Organization, new Law on spas should be adopted as well. Serbia is for the European standards in spas, but everything is realised slowly. Yet, it is being realised! One example of it is an offer of the spa from Kanjiza, which goes like this: „a room with a view on Europe“! Apart from spa and rural tourism Serbia has the food on the offer for tourists. Everything the nature offered to a man would be used up in a proper way and it would increase the food production. The food will be sold to the international and domestic tourists and thus the economic cycle of agriculture, good food – brands and tourism would be closed. In addition to the spas where people go for the remedy, recreation, rest the question why would an international or domestic guest like to visit nicely arranged villages? We should say here that the idea of tourism appeared due to the necessity of people from the developed countries and cities to find a food relaxation. A man got tired of unnatural way of living in towns and thus he needs to be a part of the unpolluted environment, to be on the places where the climate is pleasant, accommodation terms are favourable and where they could see culture, historical monuments and etc. The forecasts that in 2020 in the world there will be 1.6 billion international tourists annually, which is an increase of over 100 percent in relation to 2003!

Conclusion

The Global Tourist Organization suggested that Serbia should develop its rural and spa tourism, highlighting that these are ideal conditions for its development. Now Serbia could offer eco-tourism and spas, which is a substantial resource of the inflow of foreign exchange currency. In the end of the working week a tired man needs to spend time in the green environment, to listen to gurgle of a clear stream and to breathe in fresh mountain air. All this could be found in a village or spa. It is necessary that the agrarian policy – makers realise that the agriculture and tourism are developing chances of Serbia. The agriculture produces food and through its sale in tourism you could turnover money and make a profit. Therefore, it means that these two branches have to become the strategic branches, which will give full contribution to the development of the country. They do depend on each other and could not exist without each other. The

production of healthy food and the development of spa and rural tourism is the long-term opportunity for Serbia on the global market. At the same time, the development of agriculture and tourism might stop leaving of the young from villages and could enable the return of those who are left without a job during the transition. To return to a village does not mean becoming a pauper, but dealing with the agribusiness.

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Economics of agriculture

SI – 2

UDK: 631.11.11:338.48-44 (1-22)

SERBIAN FAMILY HOUSEHOLDS IN RESPECT TO RURAL TOURISM DEVELOPMENT

Sreten Jelic¹, Jovana Gligić Dumonjić², Boris Kuzman³

Abstract

In this paper is given relation between rural household and rural tourism. Serbia has numerous resources for rural tourism development. Involvement of households, economic and no economic activities which have interest in rural tourism development, tourism should become one of the most important generators of rural development and therefore overall economic activities. Resources of family households in Serbia are significant and enable their members to participate in touristic activities also. Family households in rural areas can produce healthy food which is important part of rural tourism development.

Key words: *family households, rural development, rural areas, rural tourism.*

Introduction

Family households in Serbia occupy the biggest part of arable land, the most of cattle, perennial trees, agricultural machines, buildings, working power. In rural areas of Serbia live around 42% of total population and part of them participates in agricultural production. Active farmers are 526.960 of them. Members of family households are bearers of agricultural production and also other activities in rural areas. Serbia has numerous resources for development of rural tourism. Bigger involvement of agricultural households and economical and no economical activities which have interest in development of rural tourism, it should become one of the most significant generators of development in rural areas but also overall economical activities in Serbia.

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Rural areas have enormous possibilities for organic food production as one of the most significant factors for rural tourism development.

Family households are at the moment in process of considerable changes which have influence on rural development and also to each member of households putting them in position to adapt to economical survival. Knowing that dominant activity in rural area is agricultural production which doesn't fulfill all needs of family households, some of those households engage in other activities, including rural tourism.

In order family households to have significant role in development of rural tourism it is necessary to take appropriate measures for development not only of agricultural production as basic activity in rural areas but also development of other significant activities.

Scope of living conditions improvement and development of infrastructure in rural areas, as much as providing of necessary funds for development and improvement of agricultural production and other activities is something that development of rural tourism depends on.

Purpose and method of paper

This paper has goal to indicate on significance of family households to development of rural tourism. Particular attention is given to those family households which have appropriate resources. In this paper will be show structure of family households according to some determinants derived from statistical data published in editions of Serbian statistical college.

Resources of family agricultural households are significant but it is necessary to create condition for development of rural settlements which already have some possibilities and chances for development of rural tourism, agricultural and other activities.

Family households as basic activity have agricultural production, but more and more households become mixed because they beside agricultural production start to participate in other activities among which is rural tourism. All this have influence on rural development.

Results of research

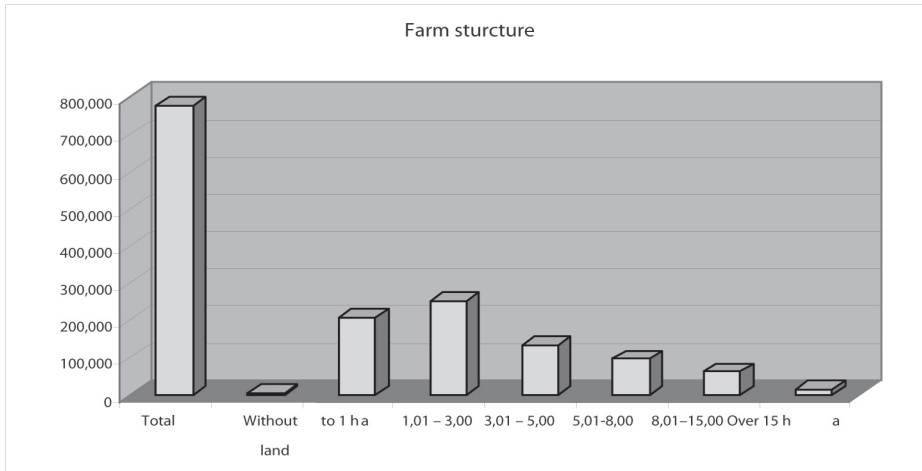
In second half of 20th century family households changed significantly. Changes in demographical and socio-economic structure of rural population had influence also on households. Number of total and active agricultural population decreased which also lead to decrease of working population in family households.

Unfavorable ownership structure of family households in Serbia had significant influence on development of small households in the first place. Certain legislative measures should regulate inheritance of households, which may stop their further division.

Changes that reach rural areas at all had influence also on family households

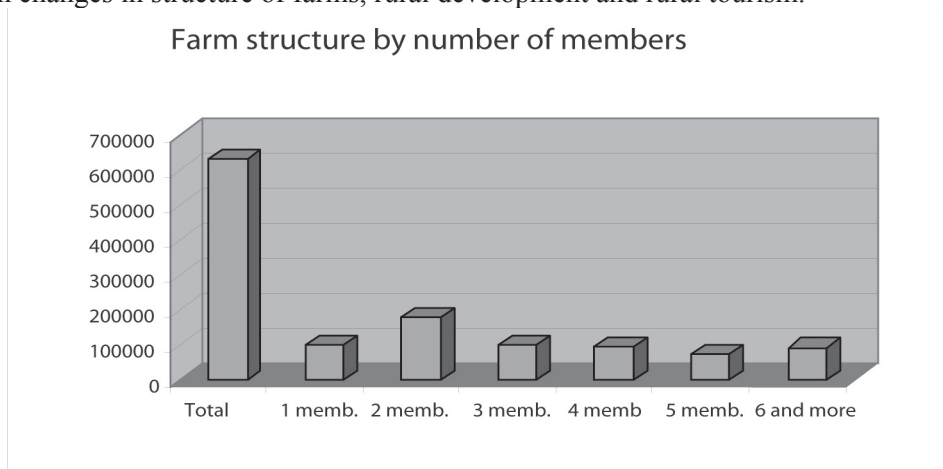
and farms. Average household get smaller because young get away to cities looking for better living and working conditions which lead to changes in structure of family households and farms.

Basic characteristics of family households in respect to ownership structure shows that they are small and split. Such ownership structure of farms has negative influence on scope of agricultural production. All this impose necessity to regulate ownership structure by legislative measures.

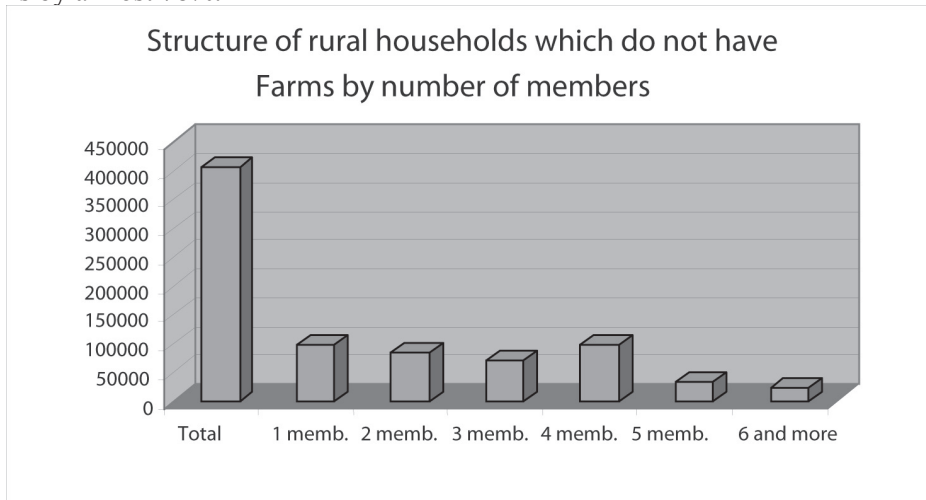


Source: *Agriculture, Census of population, households and buildings in 2002, Agriculture, Agricultural funds, 2003, page 20 and authors calculations.*

Data of ownership structure of farms show that prevail small, split units. Changes in number of farms and their size emerge by numerous reasons, but the most important are changes in number and structure of working power. Reduction of rural population, first of all active farmers, also increase of aged households had influence on changes in structure of farms, rural development and rural tourism.



Changes in farm structure are evident. Between two census total numbers of farms in Serbia decrease from 997,235 in 1991. to 778,891 in 2002. that is near 22%. The most significant decrease, around 23%, is at farms with size up to 10 ha, and also decreases of their participation in total number of farms by 2%, which is favorable tendency. Similar situation is with farms from 10 to 15 ha, they decrease by 14% but increase in participation in total number of farms by 9%. On the other side number of farms from 15 to 20 ha increase by 5.5% with increase in participation in total number of farms by 35%. The most significant increase in number is in farms bigger of 20 ha which number increase over 38% with increase in participation in total number of farms by almost 78%.



Based on data given above is evident that small farms dominate further on. It shows that in process of restructuration of agriculture farms stay on level of small land ownership.

Considering average farm size in Serbia it is, between two Censuses, slightly increase from 2.46 ha to 2.49 ha that is by 1%. Looking this data we might think that noting significant happened in this period, but index analyze show that significant changes happened still.

Table 1. Used cultivable soil – average by farm (in ha)

Size of used cultivable soil	Average by farm, ha		Index 1991.=100
	1991.	2002.	
Without land	0.00	0.00	100
Up to 10 ha	2.15	2.01	93.17
10,1 to 15 ha	7.46	7.93	106.30
15,1 to 20 ha	8.54	10.66	124.77
Over 20 ha	11.99	22.02	183.56
TOTAL	2.46	2.49	101.22

Source: IBID., 20 pg. and authors calculation

Rural tourism and rural development

Exceptionally favorable condition for development of rural tourism, first of all, preserved nature, moderate climate, clean air, rich flora and fauna, unpolluted rivers and lakes offer to tourists different possibilities like walking, recreation, sport activities, excursions, climbing and entertaining activities. In rural areas tourists who show interest can be involved in different agricultural activities with their hosts. Out of all rural households only 800 of them in 50 villages participate in tourism and have around 2500 beds. Numerous villages are settled near valuable and well known cultural and historical monuments which could be interesting for excursions. Cultural values also have traditional buildings, products of old crafts, hand made articles, folk customs etc. It also could be interesting to visit local manifestations, exhibitions, competitions... It is obvious that family households in mountainous areas have advantage in touristic activities because of favorable conditions such as production of organic food, recreational holiday activities, healthy life conditions. Rural areas also are rich with natural beauties, have preserved nature, clean air etc. But all of this is not enough if there is not presented in right way and enriched with diverse programs. It is clear that people after hard work need quality vacation, especially people from big cities.

One of biggest problem of rural households in Serbia is ownership structure. Existing process of deagrarisation and legislative measures doesn't help much especially considering heritage and renting. Investments in agriculture, melioration first of all, were not enough and consist. All this had influence on rural households and after that on rural areas.

Conclusion

Participation of family households in production potential and production itself in Serbian agriculture is the most significant. But till present days this production subject doesn't have appropriate consideration from state administration which brought to significant mistakes. This means that we have to pay especial attention to their development and restructurisation.

Villages near big cities have chance for rural tourism development. It is necessary also to pay attention to regional development. Development of rural areas should be based on interests and realized by support of people who live in that region. Regions are base for rural development because people in some region knows the best what their problems are and what are their needs, they control many resources, local production, they know what they can and want to do. Many regions in Serbia have preserved nature, moderate climate, clean air, rich flora and fauna, unpolluted rivers and lakes and they can offer to tourists different possibilities like walking, recreation, sport activities, excursions, climbing and entertaining activities. In rural areas tourists who show interest can be involved in different agricultural activities with their hosts. Numerous villages are settled near valuable and well known cultural and historical

monuments which could be interesting for excursions. Cultural values also have traditional buildings, products of old crafts, hand made articles, folk customs etc. It also could be interesting to visit local manifestations, exhibitions, competitions...

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Economics of agriculture

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PROFIT FROM THE RURAL TOURISM AS A STIMULUS FOR THE FURTHER DEVELOPMENT OF AGRICULTURE¹

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Abstract

The aim of this paper is to raise awareness of agricultural producers to work with entrepreneurs who are engaged in tourism organization, with aim to achieve higher profits. Given that organic farming is based on application-specific approach to organizing and producing agricultural products, tourism, as a suitable market for direct implementation products for consumption, as well as for presentation to the positive effects of non-polluted environment can have on the health of the whole organism, through the introduction of various of sports and recreation, the combination of agriculture and tourism is essential. Various studies in this field has shown that now we have a positive trend in the development of rural tourism in our country, which together with increased agricultural production and exports (which continues, a positive result), we can expect to increase the total gross income of Serbia.

Key words: *agricultural production, rural tourism, rural development, ethnic houses, export.*

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Introduction

About three-fourths of the territory of Serbia are rural and rural space, inhabited by approximately half of the population. Seeking directions of development - the Serb village of old and disappearing. Although there are conditions for its development, it is still happening. The best picture is the uneven regional development of Serbia. In other words, in our country, there is a long-term policy of marginalization of rural areas. In such areas, far away from urban areas, Serbian villages disappear. Already about 4,800 villages in 200 is uninhabited, and in so many villages there are not young people under the age of 25 years.

Early sixties in the village of Devic, municipalities Ivanjica, conceived the rural tourism. However, due to bad roads above all, no ads and help the state, this effort has remained in the ranks very low tourism until the new way connected to the need for rest in nature and pastoral haven.

A review of state rural development and tourism in the world

According to the World Tourism Organization, more than 75% of world tourism demand is aimed at the natural area. It should be emphasized that it is impossible to determine the exact percentage is directed toward rural areas. The reason is the fact that a large number of visits taking place on a daily basis, and it is impossible to constantly monitor this trend.

Rural tourism in the countries of **Europe** and the **United States** began to develop the mid-sixties. In the beginning it was a family outing on weekends, because vacations are usually reserved to the sea or mountains. Research has shown that more susceptibility to rural tourism have men rather than women, and that more interest for a rural holiday show intellectuals.

Fifties, the **Austrians** began to lead in the field of the Alps. Within the national strategy for the development of backward rural areas, begin to develop the village, combines the traditional and the modern and ultimately created additional income for the people residing in rural areas.

And **Great Britain** recognizes the great potential of the village, and in the early seventies the population ratio was 1:5 and tourists in rural areas. Also stand out **Belgium** and **France**, as good hosts in rural tourism. Many agree that the French have the most diverse offer for tourists.

In the last twenty years, tourism in the villages of **Ireland** has a national cultural heritage and that is what makes it very attractive.

In **Italy**, according to some data, even 7,000 households rented to nature lovers 100,000 beds.

Income of rural tourism in some areas and regions in recent years surpassed those recorded in the so-called conventional agriculture. **Austria** and **Slovenia**, for example, last year have made two billion euros from the rural tourism, and this positive trend, despite the economic crisis continues.

Assessment of the current state of rural tourism in Serbia

The document *Strategy for the Development of Tourism of the Republic of Serbia*⁵ said that rural tourism includes the following activities:

- 1) Agrotourism, rural households, farms - visitors observe and participate in traditional agricultural activities
- 2) Activities in the nature - recreation and leisure (hunting, fishing, horseback riding, biking, climbing, hiking)
- 3) Eco-tourism, tourism that supports the protection of natural resources
- 4) Rural experience (rural tourism) - tourists "plunge" in everyday village life
- 5) Cultural Tourism - refers to the culture, history, archeology and other characteristics of rural areas
- 6) Other combined forms of special interest tourism (events, festivals, outdoor recreation, manufacturing and sales of souvenirs and local agricultural products).

Republic of Serbia has a very favorable conditions for tourism development in rural areas. First of all, it is particularly favorable conditions of preserved nature, with mild climate, clean air, unpolluted rivers and lakes, rich flora and fauna. These benefits are especially pronounced in the mountainous regions - the hills of Tara, Divcibare, Ozren Povlen, Rtanj, Bukulja, Oplenac, Suva Planina.

Serbia has a long tradition of rural tourism, and yet we can say that is still in its infancy. Tourism is now dealing with over 300 households in 40 municipalities, with a bid of about 3,000 beds. Price per night is between 500 and 2,500 dinars. Thanks to the growing interest of tourists, visitors in the last four years, growing 30% a year. And offer follows a similar trend. Only Gornji Milanovac has 80 registered rural households with income from accommodation of last year amounting to 230,000 euros, we conclude the following: "Profit from rural tourism can be used for development and improvement of agricultural production".

Visitors of our ethno village may not be accustomed to life with the locals, harder to understand their thinking and the environment. On the other hand, in ethno villages there should be stable with the cattle and milk processing facilities, development of winter supplies and facilities for weaving, various workshops in which work would be attended by tourists, as it is the case in Italy. Because it is authentic, the village is attractive to people from urban areas.

In the course of 2004, Serbia has been the construction of two typical farm with all the characteristics related to the life and customs in the region of Vojvodina (farms 84 and 137), which are included in the tourist map of Serbia. Many villages throughout Serbia are a basis for further planning of the development of rural tourism. In that direction, as an integral part of tourism, we promote local, regional and national aspects of our country.

The following year, in Serbia, will begin the implementation of four pilot

⁵ Strategy for the Development of Tourism of the Republic of Serbia, the first phase report, the Ministry of Trade, Tourism and Services of Serbia. 24. November 2005

projects like support for development of rural tourism in the South Banat Danube, central and western Serbia. These projects will be launched in Ljig, Konjic, Kosjerić and Valjevo, and in eastern Serbia from Zajecar to Dimitrovgrad. Their purpose is to educate rural households, the teaching of foreign languages, business reception and work with guests to advertising and sales capacity of rural households.

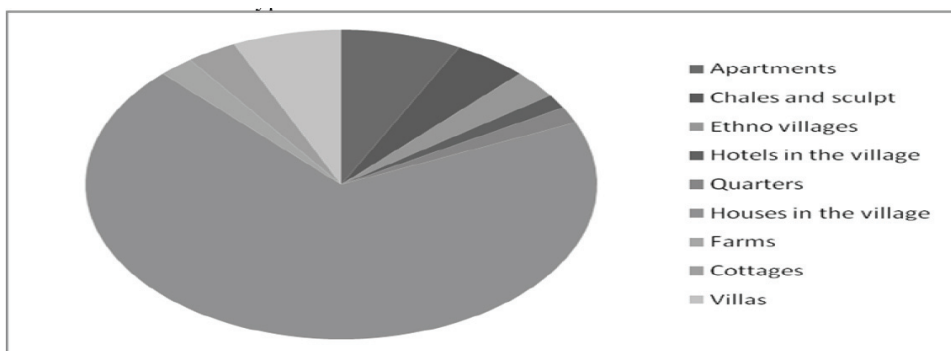
For the development of rural tourism should be applied to the appropriate standardization and classification services, particularly adequate conditions for placement. Of particular importance are the investments in infrastructure (road network, PTT), providing health care and conservation and environmental protection in order to prevent uncontrolled urbanization. One of the most important tasks in the development of rural tourism is to educate rural accommodation for doing this activity. This would be great role for nongovernmental organizations, tourism organizations of municipalities, and all interested parties

Table 1: Number of accommodation in Serbia in rural tourism by type

Type	Number of accommodation
Apartments	31
Chales and sculpt	19
Ethno villages	12
Hotels in the village	6
Quarters	7
Houses in the village	282
Farms	9
Cottages	13
Villas	28

Source: www.selo.co.rs

Chart 1: Share of each type of accommodation in the whole of Serbia



Source: www.selo.co.rs

Taking into account Table 1 and Chart 1, it is obvious that the largest share in the offer of accommodation are houses in the village, which has by far the most - 282, followed by apartments - 31 and villas - 28, but in much smaller numbers than houses in the village.

Table 2: Number of accommodation in Serbia in rural tourism by origin

Number of accomodation	Number of palces in Serbia
1	25
from 2 to 10	29
from 11 to 20	7
from 21 to 30	1
from 31 to 40	2
more than 40	1

Source: www.selo.co.rs

Note: Table 2 does not have equal intervals, in order to detect significance of many places that have a small number of accommodation (to 10).

Table 2 presents the number of places in Serbia by the number of accommodation (at intervals). We may note that the largest number of seats - 29 with a number of accommodation from 2 to 10, but being by no means even the places (there are 25), which have only one pension

The economic importance of rural tourism in Serbia

Economic importance that Serbia can have on the development of rural tourism is huge. But the production quality of spending time outdoors and in the countryside should not be left to the local population, but a serious subject of analysis if we expect visible effects. Let us start with only the common assumption that a rural household has only two rooms with two beds and to be issued to aliens 200 days at a cost of only 20 euros for full board and get the figure of 16,000 euros per year. In Serbia, half the population lives in villages so, there you can find a million households. If only 10% of these households decided that the business of rural tourism, this could bring Serbia € 1.6 billion, just out of bed and meals. If we add to this revenues from traffic, trips, spending extra services, customs ... can be expected and more than three billion euros a year, only the first time. To realize this, it is necessary to many branches of the economy up to engage. Let us mention here only the construction industry, building materials, industrial equipment, food, transportation, guide service, etc.

The importance of rural tourism to agriculture of the Republic of Serbia

Knowing the geographical position of Serbia, climate, natural resources, which are favorable conditions for agricultural development, the existence of depression in Vojvodina, Macva, in Kosovo and Metohija, represent great potential for agricultural development and food production. Observing the state of agriculture before World War II, between the wars, during the war of the nineties, farming village is basically improving the sustainability of which is necessary to create conditions for work and returning people to the countryside, increase the standard of farmers, invest in infrastructure, take advantage of the low level of pollution resources because in such conditions Serbia has a chance to develop tourism.

In Serbia, for a year, 4.6 million hectares of agricultural land produces about 10 million tons of agricultural products worth about 3.3 million (in 2006). From tourism we have an income of \$ 400 million, of which the revenue structure dominated by food and services to foreign tourists, accommodation in spa charges, tolls, and selling other services, especially in rural tourism. Food exports in 2006 we realized foreign currency income of 1.26 billion dollars, which represents one fifth of total exports of Serbia. If in this department has filed about billion euros to the production of organic food and tourism would be greatly developed. Already in 2010. year should be double food production and value is expected to reach 6-7 million, and exports to increase to over 2 billion dollars. It is expected that by 2020 the profits from tourism reached a value greater than \$ 2 billion. In the European Union about 10% of the population opted for the use of genetically modified food. Investing in raising food that is not genetically modified, in Serbia would be no ability to export agricultural products to the European Union, which would attract a certain number of foreign tourists, increase investment in rural tourism and prevent the disappearance of the village, because the substantial amount of money left domestic tourists, too.

About 85% of Serbia consists of rural areas where half the population lives, and of rural development as a whole, depends on the development of rural tourism in Serbia. With economic development increases the range and quality of tourism services, which in conjunction with the development of agriculture and food security for tourists takes the invisible export of food, encouraging rural development and employment. Our villages are located in an attractive natural environment complemented by the diverse range of farming, the possibility that tourists engage in agricultural production, processing agricultural products, etc.

Conclusion

Serbia prospects is in the agriculture and tourism. These two industries need to be closely linked because both recon on each other and their common ground - the village. Perspectives for agriculture and rural tourism is more than great. The world's

most wanted quality food, particularly those produced in a healthy way. Serbia this year, an estimated Observer, classified among the 20 most attractive destinations in the world (14th) and that the best way of talking about our perspective. The wealth of different rural areas of Serbia has a basis on which can be based and its tourism development plan. Tourism and its strong impact will have a positive impact on the overall economic life of these areas.

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UDK: 338.483.11 LAZAREVAC

POTENTIAL OF LAZAREVAC MUNICIPAL AS FRAMEWORK OF TOURISM DEVELOPMENT

Tatjana Jovanović¹

Abstract

Lazarevac Municipal disposes of significant resources which could have decisive role in tourism development. During work on the paper, beside official statistical data of Statistical office of the Republic of Serbia also was use available data of the Municipal. Results of this research shown that Lazarevac Municipal with its all settlements has a great chance for significant tourism development. Aim of the paper was to point out potential of the Municipal, on the one side and tourism development on the other side. Natural values of Lazarevac enable development of tourism, first of all recreational. Numerous water potentials (river Kolubara with new simplex lake, Stara and Nova Očaga, several artificial and natural lakes and pools) are wealth of Lazarevac and well development base especially for recreational, fishery and rural tourism. Mentioned resources, comparative advantages and development programs also give chance for tourism development.

Key words: *resources, municipal, tourism, comparative advantages, household.*

View and method

Aim of paper is to point out resources of Lazarevac in function of further tourism development. In paper are shown some handles of natural values and capacity of Lazarevac Municipal based on statistical data published in reviews of Republic institute for statistics of Serbia and Municipal of Lazarevac. Specific review was given on rural settlements, households and farms. Beside statistical data from study named “Study of local economy development in Lazarevac Municipal” in the paper was also mentioned potential for development of households and tourism.

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Research results

Lazarevac Municipal is placed near River Kolubara, about 55 km south-east from Belgrade at average 147 m above sea level. Settlements of Municipal are outspread an area of 379 km².

In this area the most significant resource is coal (lignite). Quality of exploited coal belongs to category of low quality fuels with high concentration of water and ash. Under forest is around 18% of area, that is 7,024 ha, from which 800 ha are planted in period from 1973 to 1993 on barren soil and near 35 ha on ash dumps. Lazarevac Municipal is consisting of 33 settlements, namely 34 land registry (Sakulja is not populated). On area of 379 km² it consists of 44 local communities and 11 local offices.

Lazarevac is the biggest settlement and administrative and economical and cultural centre of Municipal. According to its significance and according to model of area organization and regional centers from Organizational plan of Republic of Serbia Lazarevac represent sub regional centre.

In Lazarevac Municipal polarization in system of settlement is very emphatic. According to basic functions villages are categorized as primary and centre of village congregations. Primary villages are the most numerous categories in Municipal. Their basic characteristic is small number of inhabitants and mostly agricultural population. Some of villages, with big number of nonagricultural population (working in town), are in fact suburban settlements and are functionally connected with town.

Primary villages in Lazarevac Municipal are: Cvetovac, Sokolovo, Leskovac, Vrbovno, Kruševac, Prkosava, Strmovno, Mali Crljeni, Trbušnica, Medoševac, Zeoke, Brajkovac, Barzilovica, Čibutkovića, Arapovac, Mirosaljci, Županjac and Bistrica.²

Centers of village congregations consist of several primary villages which make one area unit. They are settlements of highest category in regional organization of villages, and differ on number of inhabitants, geographical location, infrastructural accomplishment, formed nucleus of public services, production activities etc. So in Lazarevac Municipal we have: Veliki Crljeni with belonging villages Cvetovac and Sokolovo, Stepojevac with Leskovac and Vrbovno, Rudovci with Kruševica, Prkosava, Strmovno, Mali Crljeni and Trbušnica, Vreoci with Medoševac, Baroševac with Zeoke, Dudovica with Brajkovac, Barzilovica, Čibutkovića and Županjac, Junkovac with Arapovac and Mirosaljci.

Tourism development

Tourism in previous decade share destiny of economy and it also record decrease in Lazarevac Municipal. Insufficient infrastructural accomplishment and investments, low economic activities, social problems, undeveloped and maladjusted market, inadequate valuation of natural, material and cultural values and unmatched

² See more in Local ecological programme in Lazarevac Municipal, Elvod-print, Lazarevac, 2006. page 5-19.

economy structure had influence on tourism development. In order to develop tourism more intensively it is necessary to have integral approach in creation of conditions for implementation of existing natural values and capacities.

Tourism development gives possibility for better employment of local population. That is very significant considering unemployment rate, depopulation of Municipality and inadequate educational structure of employed.

Municipal resources offer different possibilities for establishment and development of small and medium utilities based on family principle. In contemporary economical and social tendencies special attention is given to small and medium utilities from tourism and complementary activities in function of further affirmation of tourism.

Municipality in year 2003. visited 1,627 tourists and made 4,780 overnight stay. Structure of tourists was predominantly domestic.³ It is necessary to have in mind that tourism also contribute to development of commerce, traffic, construction industry, agriculture and other departments.

Lazarevac Municipality has great possibilities for development of fishing and hunting based on natural resources such as forestry, mountainous areas, numerous rivers, creeks, lakes, pools and beautiful landscapes. At several locations is planed to carefully set river banks and make watering places not only for recreation of people from Municipality but also for tourists. It is also planed to make a few shooting areas.

Recreational facilities in Lazarevac include City recreational centre, open swimming pool, recreational centre on Lake Očaga, Recreational centre Kolubara (new sports hall, football court FC Kolubara, balloon hall).⁴

Cultural heritage of Municipality is very diverse. The most important buildings are Church-crypt St. Velikomučenik Dimitrije in Lazarevac, Monument of Knez Stanoje in Zeoka, Family house Vasić – Karadjordjeva Street, Mortuary of Knez Aksentije Miladinović in Čibutkovića, Family houses Dimitrijević in Leskovac, Đurđić in Dudovića, Miletić in Vreoci and Perlić in Dudovića.

Lazarevac also have well known archeological sites such as: Lugovi – Županjac, Batašina in Stepojevac, Ravnice in Leskovac, Petkovića in Mali Crljeni, Watchtower in Rudovci, Brekinje in Vrbovno.

Famous buildings are Church of Pokrov Bogorodičin from 1845 in Baroševac, Wooden Church of St. Georgije from beginning of 19th century in Brajkovac, Church in Čibutkovića from 1848, Church of St. Trojica from 1863 in Junkovac, Church of St. Dimitrije from 1891 in Leskovac, Church of St. Paraskeva from 1862 in Petka, Church of St. Arhangel Gavriilo from 1869 in Šopić, Wooden Church of St. Georgije from 1815 in Vreoci.

Lazarevac also have buildings of rural engineering, village cemeteries and monuments such as: old house of Anđelija Milić – middle of 19th century, old house

3 See more in: Study of local economy development in Lazarevac Municipal, Belgrade, 2005. page 13-14.

4 Ibidem, page 16-18.

of family Negovanović – Serbian shack from beginning of 19th century, old house of Zorka Milošević – first half of 19th century, old house of Lila Đurđević – middle of 19th century, old house of family Kržalić – middle of 19th century, old house of Borisav Lazić – second half of 19th century, complex of buildings of elementary school – second half of 19th century, old house of family Ranković – first half of 19th century, five monuments placed in front of communal building from 1876 – 1914, etc.

On territory of Municipality Lazarevac there are Modern gallery (legacy of Lepa Perović), collection of sculptures in Primary School in Dudovica, Studio of naive sculptor Bogosav Živković in Leskovac, Painters colony in Rudovci etc.

Development of rural tourism should take significant place in tourist offer of Lazarevac Municipality. Lazarevac has several villages with adequate resources and tourist motives (lakes and rivers for fishing, forests and hills for hunting, interesting landscapes for pleasure going...) and as such must be included in tourist offer. Rural tourism is attractive to those tourists who enjoy in rural atmosphere, use natural characteristics of rural area, stay in family households, consume domestic food and participate in its gathering and cooking. On their demand tourists could participate also in agricultural and stock farming activities.

Development of rural tourism has influence on total economic development of village, enabling family households marketing of their products. It is obvious that rural tourism in Lazarevac have significant tourist potential that must be realized. Among households who lead in tourism development should be emphasized household of family Vujnović.

Household Vujnović

Household of family Vujnović is placed on periphery of Lazarevac town (5 km from centre on town on Lazarevac-Arandelovac road, 7 km from Ibarska Highway, 55 km from Belgrade, 35 km from Arandelovac and 80 km from Čačak), in village Dren, on 300 m above sea level. Central building is placed on yard of 3600 m². House have central heating, ADSL internet connection, two phone lines, SAT programs, air conditioner, three bathrooms, garage, associated objects with different workrooms in which guests can have fun and with help of host learn something new like stiffening, needlework, tissue, paint on pottery, drying fruits and herbs and distilling of liquor. .

On guests demand could be organized excursions to memorial script of battle on Kolubara, wooden church in Brajkovac, rural house in Lazarevac, indoor and outdoor pools in Lazarevac, Coal mine Kolubara, heights of Kruševica and Stubica etc.

Conclusion

Lazarevac Municipal has comparative advantages for tourism development such as:

- It is placed on crossroad of important main roads,
- Lazarevac proximity to neighboring Municipalities and to Capital of Serbia,
- Connectivity of local communities with adequate infrastructure,
- Accomplishment of significant number of households with necessary facilities for tourism development.
- In aim to improve tourism in Lazarevac Municipal it must be taken following activities: making program of tourism development and acceptance of documents in accordance with standards for planning and regulation of tourist places on Municipality area, improvement of communal conditions for visits and stay of tourists, beneficiation and improvement of quality tourist offers, organization of informational and promotional agency, organization of cultural, sport and other manifestations interesting for development of tourism, activation of Municipality in regional and national activities and programs for tourism development, improvement of informational systems in Municipality, planning and installing of road signaling, presentation of Municipality on tourist fairs and tourist markets, publishing of advertising materials.
- Local authorities should compete for bankrolls in new established Fund for development of tourism by Ministry of commerce and tourism of Republic Serbia. Resources of Fund could be used for making strategies for tourism development, financing of tourist infrastructure, financing of professional training for tourist staff, consolidation of local tourist organizations and financing of other activities from tourist areas.

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AGROTOURISM AS A GENERATOR OF REGION DEVELOPMENT

Marija Knežević ¹

Summary

Agrotourism is a part of contemporary tourism and presents an essential factor of rural tourism in a rural environment, including all activities that occur with respect to tourism. It is based on the competitive advantage of the area, tradition, specificity of agriculture and people. The totality of these elements makes a complete tourist product, which provides the following services to the tourists: accommodation, rest on the farm, also various specific agricultural contents: getting the children acquainted with the farm animals, the presence during agricultural works, food production: bread, wine, brandy, food for winter, collecting medicinal herbs, tea, mushrooms, snails, as well as adventurous contents: riding, driving in horse-drawn carriages, teaching traditional crafts: production of cloth (weaving), crochet, embroidery, production of tools and similar. What is essential for an agricultural destination is its uniqueness and distinctiveness with regard to the competition. Bosnia and Herzegovina is very specific for it offers many different contents on a geographically narrow area which can be combined into a tourist product. As it becomes more attractive tourist destination, neglected agriculture is a factor that can significantly support the development of tourism in the entire region.

Key words: *tourism, agrotourism, rural tourism, agricultur*

Actuality of Bosnia and Herzegovina for tourism in the region

The geographical location of Bosnia and Herzegovina (and RS) in the region is very favorable for the development of tourism, especially the rural one. As the agro-tourism is a generator for rural tourism development, the image of BiH² is determined by its elements, in particular the following ones: a healthy environment and still untouched nature, unexhausted land that is able to provide a source of healthy food for a longer period of time, diversity of

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2 In further work, we will use usual abbreviations:BiH-Bosnia and Herzegovina and RS-Republic of Srpska.

climate, terrain, demographics, historical factors in a small space, as well as the gastronomy and the genuine hospitality of the people³. All these factors are the key factors of the interest for a modern tourist, which provide perspective and increased interest of tourists to the region. The data show an increasing movement of tourists towards the Balkan region, and predictions of global tourism trends fully support this tendency.

The advantages of global trends and global changes are evident and positive when it comes to tourism and agrotourism: the economy is becoming "world category", so we, like it or not, become a part thereof. The high degree of development of information technologies and their applications in agriculture, agribusiness and tourism, the transition processes in the region where we belong, breaking the barriers that previously separated some countries, are the processes that lead to the opening of our region to the world. Tourist market has become a "world one" in all respects and for all kinds of activities, namely tourism has become the largest factor in breaking the limits: historical, ethnic, cultural, religious, demographic ones. Such an orientation is confirmed by the datum that since 1950 until the end of 20th century (ie. for 50 years!), the number of international travel increased by 20 times, while the income from tourism increased by about 140 times.

Obvious movement of tourists toward underdeveloped countries of Asia and Australia, as well as loss of interest for the tourist offer in Europe and America in the last century. Designers of the management processes need to see this causes of the shift, and on the basis of this research to create a future tourist policy and tourism development of their countries. Comparison with these countries, discovering our competitive advantages and converting them into attractive tourist products is the main task of local managers and all other stakeholders of tourism. In this process, very important is that many benefits of globalization do not reflect negatively on tourism in developing regions, as noted in Milocers Economic Forum, 2008, because: „*Putting on global uniforms is not the only chance for small countries*“.⁴

Internationalization and globalization as the factors of development of agrotourism in BiH

Internationalization is the model, method, goal, necessity, and a fad in the business of modern economy. Tourism in these processes is leading due to several obvious indicators of internationalism: today's citizens and tourists are very well-informed, broadly educated, highly mobile, work less and have more free time. Modern tourists go on holiday more often, stay on holiday for a shorter period of time, are more concerned about health and require more contents during the holidays. Average citizen – tourist in BiH also “suffers” from these characteristics, which makes him a part of the global tourism system, which facilitates understanding of the changed interests of tourists, according to which tourist policy in the region should be

3 Even famous Bosnian writers Mesa Selimovic and Ivo Andric wrote about the specificities of a man from this area, who receives guests with pleasure.

4 Milocerski ekonomski forum 2008, Kuća štampe plus, Zemun, p. 343-353.

directed. The economy of Bosnia and Herzegovina cannot survive or develop in isolation and without linkage to the region and international organizations that offer a range of benefits and advantages, such as the OECD, UNWTO and the European Union. In them there is business security, which is crucial on otherwise uncertain tourist market. These organizations offer a range of other benefits and aid in business: the maximum economic growth in a sustainable manner, creating opportunities to increase employment in member countries, a variety of other ways to raise the living standards of each member country, promoting and encouraging economic development of new members, improvement of working conditions in tourist industry.. However, we live in a space and time of limiting factors of internationalization, which means that we cannot just wait for its advantages, but we must look for other mitigating and accessible elements of international business. Cross-border cooperation with neighboring countries in the Balkan region, linking of complementary economies and tourist potential and creation of a unique tourist product in the region, are the ways that the countries of the region become a system, destination, location or tourist product that appears on the global tourist market. Creation of unique and entire tourist product ie. destination, is the cheapest way that small countries in the region sell their attractiveness, distinctiveness and diversity. It is wrong to wait for the effects of globalization and internationalization, because tourism is an area where much can be done independently of the major countries and systems, just insisting on the diversity, uniqueness and isolation. Globalization, like any other process, brings someone a benefit and someone a detriment. Users of tourist offer enjoy in it: they have a wide range of offer, lowest prices, best service. Capable producers also enjoy: they have access to world consumers have easier access to foreign funds, effectively allocate their products on global markets. States easier perform on the world market, globalization does not diminish their power, only leaves them less room for error, which, often, smaller countries do not understand. Besides mentioned advantages, it is necessary to point to several negative consequences of internationalization and globalization, to which attention should be paid by designers of management processes in tourism of our region: the polarization of the rich and the poor, the prevalence of large international companies, the loss of individuality and fitting into the broader code of conduct from the economy to politics. However, small and underdeveloped countries in transition can create their own tourism policy by insisting on the separation and isolation, ie. a diversity which has become a huge competitive advantage in modern tourism. Along with a sound and unused nature, agricultural resources, the gifts of nature such as spas, beautiful rivers, mountains, villages and towns rich in history and culture, and special people, they can be fully competitive in the global market. Problem in this process is that the eyes of most small countries in the world are focused on the magic attraction of the small number of highly developed and technologically advanced countries and because the strategy of their politicians is only one: "We want to go with you, accept us."

Agrotourism as the generator of tourism development

Agrotourism is a part of tourism which is closely related to agriculture and agricultural production. Therefore it is a necessary part of rural tourism in which agrotourist offer is fundamental: food on the farm estate, attending various events around the food

production, accommodation in traditional buildings, and all of this in every village or rural setting is original, authentic, unique. In this environment, the customer is not just a number, or a room key, but part of family communication, friendship, he goes hunting, participates in the production of food and drinks, gets acquainted with domestic and wild animals and becomes a player in a variety of religious and folk events. Guest participate in making various items of work in the traditional way or in the works that represent each area: the old crafts, garment manufacturing, weaving, crochet, sewing, knitting, canning production, brandy, wine, and the like. The guests on the farm have the opportunity to learn, to socialize, to feed on the original product, also to buy them and and carry them home. In addition to explore the surrounding destinations, rich cultural and historical contents, use of religious sites, health, sports tourism, the customer has the opportunity to experience the full atmosphere of travel, to take it with him and to remember it, and to recommend it. And this is the point in rural tourism and agrotourism as its basic part.

Bosnia and Herzegovina, for this type of tourism has all the resources: fertile lowlands (Lijevce and Popovo Polje), a plateau for all types of cattle-breeding (Livno, Glamočko, Nevesinjsko polje), the world-known tourist recognized rivers (Una, Vrbas⁵, Bosna, Drina, Neretva, Tara, and Trebisnjica), famous spas (Laktasi Kulasi, Seher, Mljecanica Teslic, Slatina, Kiseljak, and Rogatica). If we add to these gifts of nature the world-famous center of sports tourism (Jahorina⁶, Bjelasnica, Kupres, Vlasic, Kozara), famous centers of religious tourism (Medjugorje, St. Ivo, birthplace of St. Vasilije Ostroski), we can conclude that we live in a region of great tourist potential of agrotourist and tourist potentials.

However, agriculture and rural tourism are low productive areas, from the standpoint of capital, and it is necessary to find less expensive options for inclusion in the processes of regional tourism and the wider tourism offer. The path to integration leads through networking with the similar or completely different, in order the offer to be packed into one complete system of offer at a certain location, where the clusters are one of the possible and very acceptable models⁷. The advantages of linking or networking are: cheaper creation of target groups, improvement of productivity and lower costs of promotion, advertising, brand. Further benefits of linking are better division of labor among organizations dealing with rural tourism and better allocation of human resources in terms of expertise and competence. Clusters are able to facilitate: lobbying in the authorities at the local and state level, in international organizations and financial institutions, can facilitate the access to modern knowledge and experience without investigating what has already been investigated but to use experiences from the environment. Competition is, in a system

5 In May 2009, on the Vrbas, the World Championship in rafting on Wild Waters was held.

6 On Jahorina and Bjelasnica, Winter Olympic Games were held in 1984.

7 In the R. of Croatia there are the clusters but also other forms of networking supported by the Ministry of Agriculture, Fishing Industry and Rural development, providing the funds from IPARD program for accomplishment of the rural development plan 2007-2013. [http:// www.hgk/ wps/portal/15.04.2010](http://www.hgk/wps/portal/15.04.2010). In R. Of Serbia, there are positive experiences in cluster formation in wood industry which should be used in BiH.

of clusters, specific and represents a delicate mix of rivalry and cooperation, and basic values of collaboration are: trust, team spirit, transparency and cooperation in the interest of greater profit, regardless of the competition. High-quality enterprises cooperation within the cluster reduces transaction costs and further increases the competitiveness of each enterprise, villages, agricultural sites and tourist destinations.

For small, transitional and underdeveloped countries, such as the Balkans region countries, important is also social capital, or social entrepreneurship, which has been emphasized by Drucker (1992), giving it a number of advantages over traditional entrepreneurship. The need for social businesses arises from the inability and the incapacity of many governments to, through the humanitarian activities, meet social expectations and improve the standard of the majority of population. Social entrepreneurship is a combination of best-practices of profit and non-profit sectors, where very important is the role of entrepreneurs whose characteristics are creativity, innovation and willingness to risk, and not profit. Therefore, the aim of this entrepreneurship is creating new social values, and if they accomplish more or less profit no one takes it but it is used to achieve the mission of social entrepreneurship which is opening of new work places and employment of disadvantaged groups. In order to accomplish this mission, very important is a key figure - the entrepreneur, who must have the positive personality traits: a passion for business, focus on product and consumer, perseverance despite failure, executive intelligence and innovation, creativity and willingness to take risks, along with a rich and modern management practices.

So, in order that BiH tourism (and tourism in our region) is being developed in these directions and to follow mentioned (favorable) global and international trends, it is necessary to create a new tourism policy that will cover some important novelties such as:

- To develop a strategy for tourism development and rural tourism at the level of the States⁸,
- State action in terms of networking, training of tourist managers, lending, promotions and branding, strengthening rural infrastructure and social entrepreneurship,
- Using positive experiences from neighbouring countries (Slovenia, Croatia, Serbia).

By these measures of the state, rural tourism would be tied to agrotourism and would become not only complementary but the main activity, which would change the entire ambience of village life and thereby the village would become a new tourist destination. Some improvements in the functioning of the state are on the horizon, which is supported by the data on increasing agricultural production in RS, return to the village, reviving agriculture and arranging of old traditional houses for accommodation. Ethno villages, resorts, sports facilities,

⁸ Republic of Srpska in 2010 completed the Tourism Development Strategy. New Act on Tourism was passed, Strategy of Rural Tourism Development was made.

hiking and biking trails, rafting and other forms of tourism are being developed and have the perspective to network tourist offer and create sustainable development for a longer period. There are some incentives for the development of agriculture and opening of access to EU funds, and keeping the favorable policies in terms of breaking the political barriers (visa regimes, customs, etc.). With these measures of the state, along with other complementary forms of tourism: health, religious, adventure, sports, the agrotourism becomes a generator of growth in all forms, because no matter what the future tourists will put to the forefront: holiday, fun, adventure, entertainment, recreation, sport he must first meet the basic material needs (food, drink, accommodation), and there is a chance of agrotourism.

Additionally, it is necessary to recognize the importance of training of staff for the needs of tourism that will recognize these global trends in tourism and agro-tourism and direct all the actors of tourism in this direction. Since the development of information and other technologies has created unexpected communication opportunities for expansion of knowledge, which quickly becomes obsolete, it is necessary to work on its modernization, and in particular to work on the concept of constant life-long education. It is therefore necessary to change the cultural environment of education, in order to reach an educational system that can respond to demands of modern tourist trends, which are much more dynamic than in other areas.

Conclusion

Knowledge management in the tourist sector should fight that knowledge is put in the necessary place that it becomes a key resource and the evaluation criterion, because only in this way we will have safer future and more open world. It is possible to go along this path only if educational institutions come closer to organizations that educate the staff, if a close and fruitful collaboration between them is created⁹. Therefore, it is necessary to redesign the education system, which needs to adapt to modern trends and demands of tourism, which apparently is going to strengthen rural tourism, agrotourism and complementary forms of tourism, or in the direction of the return of a man to "mother-nature" and natural unity with it.

As mass tourism has not been accepted in the third world countries, it is considered to be destructive and a new form of colonialism which destroyed their culture and values, rural tourism can be only real alternative. Along with it, there is agrotourism as its integral part, as a generator and connection of all other forms of tourism. It is important that people realize that the small-scale rural tourism has smaller and limited benefits. For longer time it will be an additional source of income, and only with time it can become the dominant economic activity, which will, perhaps, keep it from the superpowers that turn everything into "mass" and "global". Agrotourism is the area of originality, authenticity and diversity of each locality, region or destination and it should be insisted on that in the fight against the negative elements of globalization.

9 Here also we see progress in BiH: stimulation of the state for return to village, benefits in agriculture and opening of Faculties for Tourism in several cities of BiH.

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DEVELOPMENT OF AGRO-TOURISM AS ADDITIONAL SERVICES IN RURAL AREAS BRCKO DISTRICT BIH

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Abstract

Rural areas in the Brcko District provides current characteristics and rural areas may be attractive to undertake tourism activities. They presented folk costumes and folk dances, customs, religious buildings, cultural and historical monuments, gastronomy, hospitality people, etc.. Rich with natural potential and traditional values conducive to tourism as one of the possible conditions for the development of a somewhat neglected rural areas Brcko district. Area of Brcko District has the potential application of agro-tourism as a complementary activity of family farms, as a family business in most places, apart from regular farm duties; faithfully maintain the tradition, gastronomy and interesting customs that must be used to promote tourism potential. Therefore the main objective is to present tourism as a supplementary activity in the rural area of Brcko District as a solid development opportunity that will simultaneously help develop rural areas and create new jobs, which is essential in overcoming the ever-present economic crisis.

Key words: *tourism, rural development, employment, rural households, promotion*

Introduction

Rural tourism as part of the overall tourism industry, particularly important for regions rich in natural attraction such as attractive landscapes, fertile land with indigenous crops, rivers, lakes, etc. Agro-tourism involves adjusting operating farms introduction of accommodation, bed and breakfast, organizing camps, organizing work camps or on family farms (Liberi, BV 1991). Family economy in the rural area of Brcko District with the primary agricultural activities

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are a good basis for creating a variety of additional content of which has special agro-tourism. Today, rural areas become major holders of: a) the housing needs of the population, b) function of agricultural and industrial production, c) infrastructure needs of urban areas, d) space for the use of free time. The great importance of agro-tourism in the chain of sustainable development has to thank the capacity to valorize the natural features and landscapes as an economic resource. Now and in what way will organize a tourism industry in rural areas of Brčko District will depend on the support of the Government of Brčko District and the interests of local people for this type of business activity.

Materials and methods

The study was conducted in nine rural villages skirting (Islamovac, Rahić Maoca, Razljevo, Trnjaci, Bijela, G. Skakava, Brezovo polje and Sandići) from the standpoint of the development of agro-tourism. Research area covers an area of 11,643.6 hectares, which makes 23, 62% of the total area of Brčko District.

We used the method of interviews and rural tourism development of natural geographic features, led by experts of the Service of Tourism Government of Brčko District, which contributes to the relevance of data were then analyzed statistically. This survey covered 54 family farms.

Results and discussion

Under the concept of rural tourism, there are various names such as eco-tourism, rural tourism, rural tourism, tourism on the family farm, rural eco-tourism, etc. It is in fact a concept of tourism is being released on the family farm and that in the context of their tourist facilities used by rural area. In this way, creating the possibility that the family farm surplus of its products sold to tourists who visit them. This is one of the ways that family farm and realize additional income by engaging members of your household. If we add the possibility to rent the accommodation facilities, provision of catering services and other forms of providing services to tourists, then further increases the potential for additional payments to the family farm.

Surveys conducted within the regular activities of the Department of Tourism Government of Brčko District had a purpose of obtaining necessary information from the field. The survey was created and adjusted in accordance with the needs of the aforementioned Department.

The most important segments of the survey were related to the interest of respondents for agro-tourism as a complementary business activities of family farms, then on gender, age and ethnic structure of the respondents. The national structure takes into account the multi-ethnicity of the study area and from different cultural, historical and gastronomic attractions. Specifically, we believe that it is this multi-ethnicity can be a great interest of tourists.

The number of surveyed farms in rural areas was 54, of which: Islamovac 6, G. Rahić 5, Maoca 4, Rasljani 7, Trnjaci 6, Bijela 6, G. Skakava 7, Brezovo polje 8, Sandići 5.

As for agro-tourism in the Brcko District of BiH can be said to be in its infancy and that offer great opportunities and possibilities.

Since the Brcko District includes one town and 60 villages, the population is the urban-rural structure, divided in the ratio: 47.3% urban and 52.7% of rural population.⁴ Only 10 has the character of urban settlements, of which three villages including the town of Brcko, with more than 300 population/km². Structure respondents by type of family farms is shown in Table 1.

Table 1 - Types of family farms in the study area

RURAL AREA	Islamovac	G. Rahic	Maoca	Rasljani	Trnjaci	Bijela	G. Skakava	Breyovo polje	Sandici
Pure family farms (%)	41,8	38,7	40,61	37,7	56,2	50,7	53,9	46,8	41,7
Mixed family farms (%)	58,2	61,3	59,4	62,3	43,8	49,3	46,1	53,2	58,3

Source: Cejvanovic Djuric and Maksimovic

It may be noted that the structure of respondents by type of farm is largely balanced, suggesting that agriculture is not main activity in rural areas. In this regard, agrotourism as an additional activity gaining importance. From the foregoing, agrotourism as an additional category has the possibility of its own development and therefore development of agriculture in rural areas of the Brcko District (Vujovic, 2007). All the above offer agritourism in Brcko district can be grouped into several basic components, namely:

- Recreational and educational facilities, visits to several farms, organizing school in nature, educational programs for youth.
- Sports and recreational facilities, in many rural locations may be arranged some activities for tourists such as: horseback riding, jogging trails, hunting, fishing, etc.,
- Gastronomy, homemade brandy, wine, juice, meat (veal, pork, mutton, goat, kid, lamb ,...), domestic dairy products, local cheeses, homemade bread, cereal, fruit, plums, apples , ..

⁴ From a total of 60 villages in the Brcko District, 49 villages of rural character. It is an area which account for 95% of the total territory of Brcko District (471.41 km²). Of these 18 villages have fewer than 50 inhabitants / km², 22 settlements with a density of 5-10 inhabitants/km² and 9 villages with 100-150 inhabitants/km²

Conclusion

The analysis of the rural areas of Brcko District were noted great potential in terms of tourism and agriculture as well as benefits for the definition of differentiated agrotourist specific products that may be of interest not only for domestic and foreign tourists than. The survey was conducted in nine rural communities with fifty-four subjects. There was a significant human resource that is not sufficiently utilized and that the development of agrotourism programs had a greater motivation to stay in the country and contribute to preserving the quality of agricultural production. The main supply agrotourism in the Brcko District are reflected through: recreational-educational facilities, sports and recreational facilities and cuisine. Of agriculture products in the agro BD provides opportunities for networking and marketing of agricultural products from different manufacturers. Agritourism as an additional category of family farms is an opportunity for increasing income households, the opportunity for employment and rural development in the Brcko District.

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POSSIBILITY OF DEVELOPMENT WINE TOURISM IN SERBIA

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Abstract

Viticulture and Enology as an inseparable companion of this production are of great importance from the point of rational exploitation of land, employment of the population, the possibility of achieving a satisfactory income, realization on the domestic and foreign markets, the development of tourism and the like. Wine route or wine tourism is a specific form of tourism, which combines wine tasting of a particular wine-growing region with natural beauty, customs, and cultural - historical monuments of the area. The development of wine tourism could bring many benefits, to both caterers and wine producers, and could contribute to the improvement of the wine quality in Serbia. It can also provide creative and quick revival and improvement of the tourist offer.

Wine tourism could soon become one of the Serbian brands. Opening the „wine routes“ through Serbia is a very serious and responsible work that exceeds the capabilities of an individual. The state is prepared to subsidize this form of tourism, and tourism organizations are preparing „wine maps“ that will help guests to get acquainted with the eight regions in Serbia where the highest quality wine is produced. These are the wine routes of Palić, Fruška Gora, Vršac, Smederevo, Topola, Negotin, Knjaževac and Župa.

Key words: wine, wine route, tourism, Serbia

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Introduction

Wine is a beverage that has always represented a symbol of joy and happiness. As soon as the man became aware of the values of wine, as soon as he tasted its charms, he sought for a way to produce it (Radovanović, 1986). It is not known the exact time the man drank the first glass of wine, but one thing is for sure, he always thought of it as a gift of God.

That wine is actually a beverage and that, besides of its purpose to cheer and treat, it also connects people; proves the fact that the root of the word "wine" comes from the Sanskrit language, i.e. it is derived from the word "vein", which means "to be loved". It is ascertained that wine has very positive effects on human health, on the life-span and the vital processes in the human body, such as digestion. If it is consumed in moderate amounts during a meal, wine has a great nutrition, hygienic and healing value.

Wine tourism

The history of the Serbian wine production is more than 1000 years old - from the founding of Serbia in the 8th and the 9th century, especially during the reign of dynasty Nemanjić, which lasted from the 11th to the 14th century. Serbian rulers especially nurtured the culture of growing vines. At the time Emperor Dušan passed a law applying to wine production and its quality, as evidenced by the inscription from the "Charter of Stevan Prvovenčani". Emperor Dušan owned large vineyards and the royal wine cellar near Prizren (www.serbiatouristguide.com).

Wine rout or wine tourism is a specific form of tourism, which combines wine tasting of a particular wine-growing region with natural beauty, customs, and cultural - historical monuments of the area.

Science that deals with research and production of wine is called "Oenology" and this type of tourism is often called "enological tourism" (www.discoverserbia.org).

According to data from the Association of growers and winemakers of Serbia, there are about 50 small wineries in this country that have investment opportunities for construction of rooms, suites and a reception hall. Unfortunately, for now there are only three wine cellars - one located in Hajdukovo near Subotica, the second one in Tršac in Župa, and the third one in Gudurica near Vršac, which offer accomodation and food for those who want to taste some quality wine and stay for a couple of days (www.kombeg.org.rs).

Opening the "wine routes" through Serbia represents very serious and responsible work that exceeds the capabilities of an individual or travel agencies. They will have a role in this later, however, for starters, it is necessary for the state to establish standards with the help of the expert committees or the relevant institutions to deal with the problem seriously. The criteria must be set and regions and producers who will be drawn in the "Wine Routes of Serbia" must be determined. These criteria

in countries with developed tourism of this type are very strict, as it ensures that visitors will receive the highest quality service. For that reason, we have to reach the level of those countries, such as France, Italy, Slovenia and Croatia. Wine routes through Serbia will surely bring us closer to Europe (www.poljoprivreda.info).

The definition of wine tourism

When we refer to wine tourism, we refer to visits to vineyards, wineries, wine festivals and exhibitions which are being undertaken for the purpose of recreation. Wine tourism also introduces the concept and the product which is still undergoing significant changes. This term applies to two industries, and both have a significant impact on the regional economy, environment and lifestyle, and for that reason they are connected. However, the need to establish formal links between tourism and the wine and viticulture has been only recently recognized. There is still mistrust, and perhaps even more misunderstanding, in what way can wine tourism contribute to mutual development, and not only throughout the region in which they coexist.

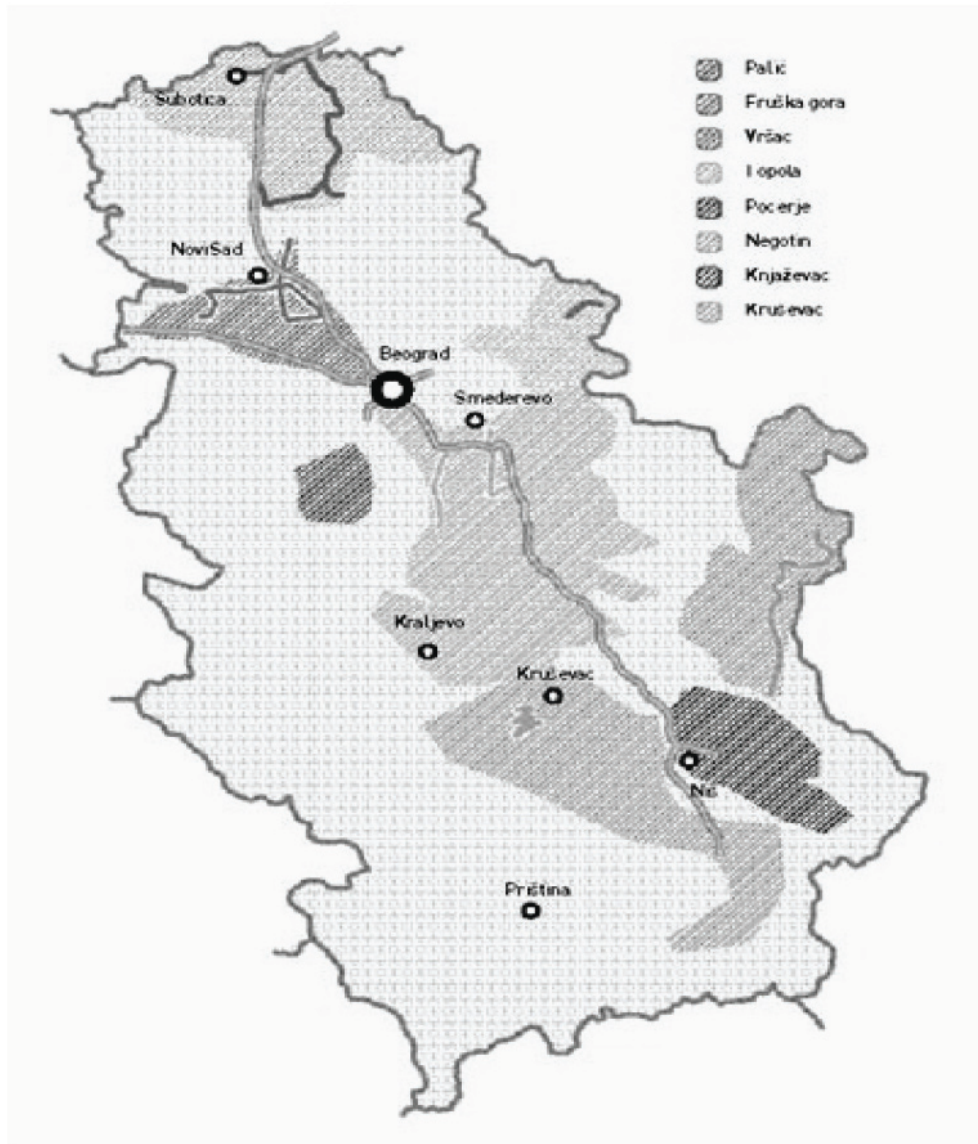
Wine tourism has to be seen from the point of at least three main participants - wine producers, travel agencies and tourists.

For this reason wine tourism at the same time represents: a type of customer behavior, a strategy by which destinations develop and sell on the market, style and attractions associated with wine, market opportunity for wineries to educate consumers and directly sell them their products.

Serbian routes of wine

Wine route is a special form of sale of wine, catering, tourism and agricultural products of a winemaking region. It consists of natural beauty, the specifications of the environment through which the road leads, cultural and historical heritage, traditions and special wine-growing area. When we mention the term “viticultural area”, we are thinking of a large number of wine producers, as well as those engaged in viticulture, wine production and the production of other specialties of the region (www.poljoprivreda.info).

The diversity of Serbia is reflected in the kinds and types of wine. The largest number of vineyards are located along the three rivers - the South, West and the Great Morava River, in central Serbia and along the river Sava, Tisa and Danube in Vojvodina. Regions Palić, Fruška Gora, Vršac, Smederevo, Topola, Negotin, Knjaževac and Župa have a great chance to become a meeting place of wine lovers (cartogram1).

Cartogram 1. Wine Routes of Serbia

Wine route of Palić

This whole region lies on a sandy soil which was formed after the disappearance of the prehistoric Pannonian Sea. That is why the wine of this area is popularly known as “wine from the sand”. Sandy fields, temperate continental climate and quality of its grapevine cultivars produce very drinkable wines. Wine tradition of Subotica-Horgoš sands is over 2000 years long.

Viticulture in Bačka progressed after the penetration of phylloxera into Europe. Then at the three localities (Palić, Čoka and Biserno Ostrvo near Novi Bečej), three wine cellars were established, which are the backbone of development of viticulture in this area today. Recommended white varieties of wine in this area are: Italian Riesling, Župljanka, White Burgundy, Ezerjo, in Čoka there are: Muscat Otonel, Semijon, and Muskat Krokani with the Biserno Ostrvo, and black varieties are: Merlot, Frankovka, Red Burgundy and Cabernet.

Wine route of Fruška Gora

Fruška Gora is the area of Italian Riesling, and by some, it is considered its original homeland. Under the above mentioned varieties is more than half of the vineyards of this beautiful mountain. The most popular wines of this region are Fruškogorski Riesling, Italian Riesling, Rajnski Riesling, Župljanka, Traminac, Bouvier, Frankovka, Plemenka, Silvanac green, Portugizer and specific aromatic Bermet.

Wine route of Smederevo

This area borders on one side with the river Danube, on the other side with Velika Morava, which, together with the relief, the climate and the soil, makes it ideal for growing grapes. The climate is characterized by regular temperature fluctuations. Grapes are produced on an area of 500 hectares.

Along with the Smederevka, other quality wines are present, which are obtained from the varieties of Italian Riesling, Sauvignon, Semijon, Traminac. When it comes to varieties of quality red wine, red varietal wine the Game is common, as well as wines of type Ružica from the variety of Prokupac.

Wine route of Župa

Župa is now known for its vineyards and hard-working grape growers who disseminate the glory of this region, as the geographical, climatic and pedological conditions for the cultivation of grape vines are certainly among the best in Serbia. Aleksandrovac with its geographical position, masters the hills and reveals a view of the vineyards Župa and the slopes of Kopaonik. Župa vineyards are located in the western part of Serbia, in the West Morava River Basin and its tributaries.

Aleksandrovac and its surroundings grow Tamjanika and Prokupac, the oldest authentic varieties of grapes in Serbia. Prokupac, also known as the variety rskavac, which is about 1000 years old, and Tamjanika, muscat variety originated from France, which has been grown in Serbia for over 500 years. Župski bojadiser Smederevka, Sauvignon, Semijon, Zupljanka, Neoplanta, Chardonnay and Italian Riesling are also grown in this area.

Wine route of Vršac

The climate of this region is typically continental. From the indigenous and old varieties, Župljanka, Smederevka, Sasla white, Rkaciteli, Kreaca are still grown here. Kreaca is an ancient white grape variety, which is native in Vršac. It has been grown all over Banat. In vineyards of Vršac, white wine varieties dominate over the black ones. Among the many top quality wines from this wine region, Muscat otonel, Chardonnay, Pinot bianco, Rajnski and Italian Riesling are noted, and a very popular table wine is Banat Riesling from varieties of Italian Riesling, Smederevka, Župljanka and Kreaca.

Wine route of Negotin

Negotinska Kraina is located in a valley surrounded by mountains Miroč, Crni vrh and Deli Jovan, on one side with the Danube and Timok on the other side, it causes a very specific climate of the area which is very continental and is characterized by hot summers and cold winters. From autochthonous and old varieties fostered here are Bagrina, Začinak, Prokupac, Vranac and Smederevka.

Among the Krajina wines, a great reputation have red wines obtained from Prokupac, Burgundy black and Game. Wines have intense red color, pleasant taste and flavour. Bagrina, Semijon, Italian Riesling, Sauvignon and Smederevka are types of white wine which are well known here.

Conclusions

Wine route or wine tourism is a specific form of rest, which combines a wine tasting a particular wine-growing region with natural beauty, customs, and cultural - historical monuments of the area. The development of wine tourism could bring many benefits, as caterers, and wine producers, and could contribute to the improvement quality wine in Serbia. It can also provide creative and quick revival and improvement of the tourist offer.

According to the Association of winegrowers and winemakers of Serbia, in Serbia there are about 50 small wineries that are able to invest in the construction of rooms, suites and reception rooms for tourists. However, for now there is only three wine cellars - Hajdukovo in Subotica, Tršac in the Župa and Gudurica near Vršac, which offer accommodation and food for those who want to taste good wine and keep a couple of days.

Opening wine routes of Serbia could be an excellent sort of stimulation for the development of our viticulture and enology. Foreign tourists would be allowed to spend time in a quiet rural area and enjoy the beauties of Serbia which our vineyards have to offer. Furthermore, tourists would be given the opportunity to visit some of the various events related to wine and grape harvest.

Wine tourism could soon become one of the Serbian brands. Opening the „wine

routes“ through Serbia is a very serious and responsible work that exceeds the capabilities of the individual. The state is prepared to encourage lending this form of tourism, and tourism organizations are preparing „wine map“ that will help guests to get to know eight regions where the highest quality products Serbian wine. These are the wine routes Palić, Fruška Gora, Vršac, Smederevo, Topola, Negotin, Knjaževac and Župa.

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Economics of agriculture

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WINERIES AND AGRITOURISTIC FARMS FOR SUSTAINABLE DEVELOPMENT OF THE TERRITORY OF THE AEOLIAN ISLANDS

Agata Nicolosi¹, Francesco Tromby, Marco Strazzulla, Lorenzo Cortese

Abstract

The research examines the production and environmental characteristics of the wine producing chain that represent the territorial system of the Aeolian Islands. The aim is to analyze the functional integration between production and agricultural landscape and to suggest some actions for the protection of the area. The research has provided a supply of a questionnaire of knowing several information: general, socio-economic and structural data of farms and entrepreneurs. The Aeolian Islands are a remarkable union between nature, art, traditions that can be exploited in an environmentally sustainable way, avoiding crossing the threshold of the carrying capacity and determining negative externalities that are detrimental to the socio-economic environment.

Key words: *Wine Growing, Agritourism, Insulation, Rural Development*

Introduction

The Aeolian archipelago, located inside the Calabro-Peloritano arc, consists of seven main islands for a total area of 117 km²: Alicudi Filicudi, Stromboli, Panarea, Vulcano, Lipari and Salina. The key feature is that the territory of the Aeolian Islands is strongly characterized by an intense volcanic activity that has affected environmental components and evolution of morphological, social and economic life during the times (Fichera et al, 2006).

The charming coast of black sand, the predominantly vine cultivated fields and forests, the unique natural features, the typical Mediterranean climate and human settlements, all these components create a mixture of natural and agricultural highly distinctive landscape.

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According to data given by ISTAT Census of Agriculture, Aeolian wine production is concentrated in the town of Lipari that with its 508 farms and its 137.04 hectares of planted area represents 62.82% of the total. This predominance of extension does not reflect a greater propensity to productions of excellence such as DOC² wines which are concentrated in the territories of municipalities in the island of Salina: Leni, Malfa and Santa Maria Salina (Nicolosi et al, 2008).

The geographical limits from the isolation are the basis of economic and social hard conditions that determine particularly detrimental situations for local businesses that have to operate in environments characterized by isolation of markets, low competitiveness, reduction of human capital, high/absolute dependence on imports and close ties to foreign investment or state aid.

The presence of these elements causes certain conditions in the economic and social analysis of the islands (Manenti et al. 2005) and in the formulation of appropriate policies for their development. In such contexts, tourism plays a crucial role in the economy of the islands. Being the only viable economy, it generates a vicious circle in relation to other local activities that become simple additional activities to the main one. The islands are subject to considerable seasonal problems related to the influx of tourism, with difficulties in the supply of basic resources and inability to distribute excess cash flows in other areas. Accessibility issues may lead to phenomena of dependence on national and international markets, especially respect to catchment areas and transport, often determining a prominent reduction in benefits on a local scale and a reduction in the added value in favor of foreign investors and intermediaries. Moreover, on the balance of the ecosystem of the Aeolian Islands it's added the pressure of mass tourism that is particularly strong in number and characteristics at particular times of the year.

The Aeolian archipelago is recognized as UNESCO, which in World Heritage Site Management Plan emphasizes the importance of a better use of natural resources, systems related to ecotourism (identified in the agritourism, wine tourism, fish tourism and rural tourism), together with the improvement of the quality and image of agricultural products made in the area, including the strengthening of quality assurance systems.

It has been shown that in a context of islands the predominant forms of business are made up by production units with a very small economic and mostly characterized by single activities directly conducted by individuals (Ruggieri, 2006).

This production structure, while allowing greater flexibility in dealing with market changes, causes a number of weaknesses related to characteristics of the reduced availability of financial resources, lack of access to the credit and the inability to implement economies of scale and scope. These issues should be added to the reluctance of entrepreneurs to participate in associations.

It's connected to the structural problems of the system of farms in the islands the cost of insularity (EURISLES, 2002), defined as the set of economic disadvantages that the units in the islands suffer due to higher-cost imports. It concerns the cost of transporting goods and people and domestic cost of production processes of goods and

2 Denominazione di origine controllata ("Controlled Designation of Origin").

services, including distribution costs.

In particular, the internal cost of production of goods and services of the island is influenced by a number of factors that contribute in large part in determining the cost of insularity. Among the most common:

- a) the weak size of domestic markets;
- b) the transport costs related to certain export transactions;
- c) the small size of the region;
- d) the high cost of agricultural plots competing to tourist resorts;
- e) the lack of available manpower for agricultural or industrial activities;
- f) the lack of convertible capital for productive investments;
- g) the incomes from estate or commercial area.

All of these factors is related to the degree of insularity of the studied area, its ability to produce tourist services and social structures. In several islands the dominance of certain sectors like tourism has the effect of the sharp decline of traditional production practices and particularly of the agriculture. This situation is not without consequences on the environment.

Methodology

This study aims to analyze the functional interactions that exist in the socio-economic system between wine production and agritourism. Considering the state of abandonment of agriculture production and the fragile ecosystem of the Aeolian territory, rural tourism, fish tourism, wine tourism, etc. represent the right balance between the natural and productive environment, influx of tourism, while ensuring respect for the environment overwhelmed by pressure from tourism, and the recovery of the historical-production, consisting of the traditional manufacturing companies, which alternatively could be converted into facilities enslaved to the touristic system. In particular it has been analyzed the ability of the wine sector to attract new economic flows generated by the impressive number of tourists that has being characterizing for many years the Aeolian area, by offering products and services suitable for securing additional supplementary income for farmers.

The research has provided as a first step the identification of socio-economic characteristics of the farm wineries in the area of the examination order to identify the main productive realities that characterize the area of the Aeolian Islands.

Based on the information obtained was prepared a questionnaire to identify the general and socio-economic characteristics of the farm wineries and agritouristic activities that may develop in them.

The questionnaire used in the surveys has provided the following information: general, socio-economic and structural data of farms and entrepreneurs.

The analysis was performed on the territorial system as a function of several variables that are closely interlinked:

1. Historic-cultural dimension: the location of the Aeolian Islands that focuses on the routes between Sicily and Naples has provided a long history;

2. Landscape dimension: the insularity and the volcanic nature has influenced the land and its inhabitants; the presence of the vineyards has affected the spatial and structural components of the islands, and also the rural architecture for the presence of typical structures for the dehydration of grapes ("cannucciati") prior to the next stage of crushing; even the sea is an important element of the landscape of the Aeolian Islands and represents an economic resource, based on fishing and related activities. The landscape consists of signs and of marine structures that have influenced the local cultural identity and strengthen the economic structure;
3. Touristic and rural touristic dimension: the most important economic sector which led to radical changes by projecting the Aeolian Islands in the international scene;
4. Food and wine dimension: the Aeolian production (Malvasia, Salina wine and capers) are known and appreciated throughout the world.

The survey was conducted during the agricultural years 2008/09 and 2009/2010. The companies identified were 12, distributed between the municipalities of the Aeolian archipelago. Particularly interesting are the companies that use its production facilities to provide holiday accommodation (Table 1).

Among the 12 companies identified during the investigation, it's produced Malvasia DOC wine, "IGT³ Salina" (white and red) "Grappa di Malvasia, loose wine, capers, extra virgin olive oil, jams, preserves and various desserts.

The research aimed to highlight in particular the agritouristic and scenic role of vineyards in the Aeolian municipalities.

Table 1 – Farm wineries interviewed in the archipelago of the Aeolian Islands (2008-10)

Municipalities	N. of interwied farms	N. of interwied farms					Agritourism activities and/or hospitality in the farms
		Type of wine		Other productions			
		Malvasia DOC	Salina IGT *	Grappa di Malvasia	Capers**	Extra virgin olive oil	
Malfa	5	4	3	4	5	-	2
Leni	3	3	3	1	3	2	3
Lipari	4	-	1	-	3	2	3
Totale	12	7	7	5	11	4	8
**"Vino Salina IGT" white and/or red							
** Production of capers, cucunci and derivatives (caper sauce, etc.)							

Considering the great importance of wine production in the 'typification' of the territory and the Aeolian and the great economic power resulting from a careful use of land resources of the islands in relation to the provision of eco-sustainable

3 Indicazione Geografica Tipica (Typical Geographical Indication).

hospitality services, it is possible to identify some important keys to restoring the local landscape system in the policies aimed at recovering the production of degraded areas and abandoned land.

Main results

The farms conductors interviewed during the research work have an average age of 49 years, a good level of preparation (the 58.34% of them have a diploma of higher secondary school graduation and 33.33). They are predominantly male (75%) and work in farms with a total farm area ranging from a minimum of 3 ha up to a maximum of 14 ha. The vineyards have an area ranging from less than 1 ha to 10 ha and are located at an altitude ranging between 50 and 600 m.a.s.l., with a clear majority, almost 85% in the range 0-400 m.a.s.l. in areas with environmental restrictions (SIC areas or SPAs) or, in the Island of Salina, in pre-reserve areas. The Aeolian Islands continue to attract tourists that from simple visitors are now residents, have purchased homes or have initiated or taken over economic activities, thus introducing into the economic territory of the Aeolian archipelago. This phenomenon has also occurred in agriculture and wine sector and 25% of respondents are not resident in the archipelago.

In 67% of cases farms are owned, while 17% are rented, and in the remaining cases are either owned or rented.

The production is certified organic and produced in 50% of cases.

Particularly interesting is the weight of family farm income on revenue that is marginally in 41.67% of companies, and represents almost all of the family income in 25% of the cases examined.

The production of Malvasia D.O.C. is present in 7 of interviewed farms, and in the range between 11 and 60 hl. It is bottled in 500-ml size and mini-bottles of 375 ml, with a sale price in the company ranging from a minimum of € 16.00 - € 18.00 per liter (8.00 € - 9.00 € a 500 ml bottle) to a maximum of € 90.00 per liter (€ 45.00 per bottle of 500 ml), and an average between € 20.00 and € 30.00 per liter.

The production of white Salina wine and Salina Rosso IGT (7 companies among those interviewed) is even in most of the cases about 25 hl. It is bottled in 750-ml size, with a sale price in the company ranging from a minimum of € 6.70 per liter (5.00 € per 750 ml bottle), up to a maximum of € 35.70 per liter (€ 26.00 per bottle of 750 ml), and an average between € 7.00 and € 10.00 per liter.

The commercialization methods are divided mainly into two types: direct sales in farms and intermediation (the farm is supported by other farms or other service companies for the sale of all or part of its production). Most of the companies has its own website where you can buy their products without any intermediary, with a rather cheap price.

The intermediation is the methodology for the commercialization of medium or large farms, characterized by high production. In this case, almost the entire production is sold to distribution companies that are able to make the product known to a number of potential customers such as wine bars or restaurants, and in the last period there is a growing interest in these products by large-scale distribution, that in the coming years

will be an increasingly growing share of sales.

Wine production is located in 40% of cases in the local market, 20% in the national and international markets, while the remaining 40% in local, national and international markets. The international market share (which varies from a minimum of 10% to a maximum of 50%) is primarily concerned with the Malvasia (+15% in recent years), with requests coming mainly from England, Japan, Northern Europe and the United States.

In the examined area 66.6% of farms offer tourist accommodation in real agritouristic farms (5 cases) or through forms of hospitality in the company (3 cases). The agritourism activity is conducted primarily through the rental of apartments and/or bedrooms. The availability of beds is between 11-20 (60% of cases) and 1-10 (40%). All the companies offer a family restaurant (no staff outside the family farm) with an availability of 30 to over 60 places.

Farms conductors have focused primarily services related in some way to food production business, according to a farm idea to be inclined to commercial exploitation of products: the opening of a restaurant in the company (in all surveyed farms) with a store (80% of companies) where the farms own productions and more are sell.

The essential services are to ensure all farms in drinkable water and electricity. In addition, in 2 companies are present structures of green building (solar panels for hot water to cut the cost of electricity using solar energy).

As for the booking service, it's dominant the direct sales by telephone, assisted by booking through email or through web site (present in all farms). The websites are exploited mainly for farms promotion, while it is totally absent the promotion through television and radio, including local stations.

This phenomenon will surely increase with the evolution and improvement in the use of information technology and electronic commerce; indeed many companies are using this electronic tool not only for reservations but also for advertising because it allows to reach a substantial number of potential hosts in a massive and widespread way, so much to undermine the typical kinds of reservations such as associations and tourism office.

Guests are of national origin (from 50% to 65%), regional (10% to 40%), foreign (from 20% to 30%); the share from foreign countries is growing and usually come from Germany, France, Holland and Belgium, although in recent years are appearing in the Aeolian farmhouse landscape (perhaps attracted by the increasing publicity of the places and local products) the Japanese and Russians, who snubbed this type of accommodation until a few years ago.

The agritouristic guides are widely used, so that all companies are present in at least one guide: Agritourist, Turismo Verde, Terra Nostra.

Conclusions

The work shows a changing situation. The area is characterized by a strong pulverization and by a strict land market for the overvalue that doesn't encourage the land consolidation. The remarkable costs of land improvement interventions are really important, linked with the insularity and the constraints placed on the whole territory recognized as a World Heritage Site.

In some sites of the aeolian territory, as those of Lipari, farming is losing an important economic value, while in other site, as Salina, the agricultural activity is strongly present. It's possible to find out two important aspect on which the aeolian economy can operate: from a side the high quality wine production activity (Malvasia D.O.C. wine and Salina I.G.T. wine), in the other side the rural tourism and the agritourism. These two aspects can join, whereas the spread of the wine-tourism.

As for the farm wineries, most of them are well under way, known on the market for the quality of their products, included in the wine road " Malvasia delle Lipari" of the province of Messina, some as early as the second generation.

The fragmentation of productive structure makes it difficult to offer competitive dynamics, with the difficulties associated with the cultivation of small plots of land far away from each other and with distribution and transport problems.

Diversification of productive activities through the exploitation of tourism in the Aeolian archipelago is a useful tool for the survival of manufacturing companies. At the same time those features of typicality of aeolian agriculture should be enhanced, in association with the farm's direct selling of products, which is often the only used commercial channel. The young age of entrepreneurs is also something that makes think positive about the possibility of adopting new technologies to make the production better and more modern, such as the choice of better cultivars in dependence of the area characteristics or the most modern methods of wine production and distribution, or by using marketing strategies able to make your product knew and then establish itself in new markets.

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Economics of agriculture

SI – 2

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FOOD CULTURE AND DEVELOPMENT OF TOURISM

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Summary

This paper analyzes socio-cultural component of nutrition and the importance of the food and wine as part of a market of cultural tourism. Also, the paper reviews on development of tourism which has, from former privileges of minorities, become a mass phenomenon, and the significance of viticulture in our country through centuries.

Key words: *cultural dimension of food, tourism, wine growing, Srem*

From minority privilege to mass phenomenon and new alternatives

It is often said that travelling is freedom, communication, happiness, means of calming down and a social therapy, a chance to find time to make a countdown (Krippendorf, 1986:43-46), it is a way of learning and cognition the world. Tourist travelling is also a person's attempt to escape from himself whereas sometimes a person does not know what he is trying to find, and he sets off hoping to find what he is looking for. It is a desire for another kind of existence, a desire to live different life (Čomić, 1990: 133,114), whereas a role play has an important place in tourism. A man becomes

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a tourist, and the tourist is “free to become whoever he wants to be, to act and to deceive himself, to be a seducer, an athlete, a fisherman, a millionaire, a nudist, an art lover, a donkey or a camel rider” (*Ibid*:115). The game is a free activity, it is unpredictable and its outcome should stay unknown to the end, because a known outcome of the game which does not allow the possibility of surprise is incompatible with its nature (Kajoa, 1965:37-38). Once, at the desired destination, tourists seek to satisfy different needs, behaving in different manners and consciously or not, play different roles (Čomić, 1990: 63). For example, when living under the same roof with a peasant in his country house and being involved in the life of the family and the village, for a tourist it becomes a game. By playing that game, he becomes a temporary member of a living economic and cultural organism such as village (Đukić-Dojčinović, 2005: 147).

Two important conditions for the development of tourism are free time and financial resources which an individual has at his disposal. In the past, tourism was a privilege of rich. The Epoch of „tourism of the privileged“ was the period of slavery and feudalism, as well as a certain part of capitalism. People started travelling in the ancient Egypt, Babylon, Greece and Rome. The ancient Greece and Rome passed laws concerning safety of strangers during their stay, hygiene conditions, etc. Members of the ruling feudal class organized various types of recreational trips, mostly for hunting purposes, and in the time of romanticism travelling was a sign of prestige (Rilke, 2001:49-50). All the way until the 20th century, the driving force of curiosity and longing to see far away places led only aristocracy to noble trips (Krippendorf, 1986:9). By the middle of 20th century, tourism becomes a mass phenomenon and at the beginning of this century it “represents one of the largest industries based on the income made from export. It is third in the world, right after petroleum and automobile industries” (Hamović, 2004:5). Once a privilege of rich, travelling lost the charm of advantage (Tripković, 2009:143), and as noted by Jost Krippendorf – “compared to the armies of mobile loafers of our days, the antic migration of people were no more than a bit better union picnics” (Krippendorf, 1986:9). Since 1889, when the first automobile exhibition was held in Paris (Arsić, 1935:46), has been a long time and the contemporary world became firstly “car-mobile”, and now “everyone wants to return to nature, but not on foot” (according to: Krippendorf, 1986:31). Endless lines of vehicles, everyone moving towards mass destinations, and “where more and more people seek rest, the most people do not find it” (Krippendorf, 1986:7. non- numerated). Due to the search for new, alternative places that provide vacation, rural tourism gets an increasing importance.

Psychological and social factors are crucial and not only economic ones when it comes to travelling. Tourism has taken characteristics of mass phenomenon and has become a component part of modern men. Tourist demand is adjusting to the declining of real salaries and the prices of tourist services, either through growth in number of shorter trips, reduction of the number of days spent on a trip, reduction of the number of family members going away, which points to the fact that worsening of financial situation does not make households give up tourist trips but only adjusting to a given state (Vukomanović, 1996:109). At the end of the 80s, as a response to mass tourism there

was a milestone in the development of tourism in that sense that it was pointed towards alternative or selective tourism whereas rural tourism became a significant segment of the overall tourist offer (Hrabovski-Tomić, 2008:21,83). Fresh air, tranquillity, intact nature, authenticity, tradition, all of these stimuli to travel represent antithesis to life in urban environment (according to: Genov, 2010:82). Since the 70s rural tourism in a large number of countries of European Union has acquired a strategy of development rural regions as a means for helping local population to stay there, opening new work positions and the possibility for additional income to rural households, it contributes the survival and development of craftsmanship, and generally social and economic progress of backward regions. In addition, natural environment and social-cultural supply make the base of rural tourism (Hrabovski-Tomić, 2008:84-85, 89) which was slowly accepted in our country in the second part of 20th century which is caused by the fact that the majority of city population have only recently left the country and going there only to represents the memory of a life from which they run away not so long ago (Bročić, 1996:258).

Food and beverage as a part of cultural tourism market

Traveling wave which started in 60s, made it possible for passengers to meet other cultures, made also an impact to the development of food culture (Hiršfelder, 2006:265). Various changes in the epoch, either in the climate or political power get their immediate reflection in the everyday food culture, as said by Gunther Hirschfelder. Food is a „total social phenomenon“. Every person eats several times a day, during their entire life. With average 30 minutes, an average European spends six years of his life on eating. If we add the time needed to prepare meals, we can easily come to ten years. Even the technical contemporary life very often spins around food. Finally, the majority of world population works solely for food. Therefore, food is a suitable indicator for analysis of any society“ (Hiršfelder, 2006:18).

National cuisine is impacted by the culture, it is a part of a country's and nation's tradition and it represents a component part of tourist offer whereas gastronomic supply is often accompanied by music and national costume in famous destinations, and it helped a lot of countries build their recognizable image (Ivkov; Stamenković, 2008:74-75).

Not a single society have developed a unique food culture, the rich ate and drank differently than the poor, men and women, young and old ate differently. Wherever there were different social groups throughout history, there was a need to present status, and in the late middle ages it was mostly done by food which made the food one of the most distinct status symbols (Hiršfelder, 2006:9,140). Even in the ancient Egypt, there were different methods of baking bread, and as early as 4th millenium BC sourdough was developed which made bread airy. Wine was spread around the river Nile in the middle of 3rd millenium BC. Wine was drunk mainly during religious rituals and it played an important part in mythology which assigns to it the power to prolong life. In ancient Greece, growing fruit and vegetables constantly progressed. Apple, quince and pomegranate were cultivated, and all three of them were called *mélon*. To give

somebody a *mélon* was a proof of love. Even ancient Greece was familiar with the poverty of firewood, and the maintenance of fire was expensive to a lot of people which is why in the ancient times, and long afterwards, the contrast between bread and porridge depicted the difference between the rich and the poor, as well as between those who lived in towns and the ones living in the country (according to: Hiršfelder, 2006:52,49,76-78). Cultural pattern was crucial when it came to beverage – to prove manliness was very important, and to deny a drink during negotiations was treated as a weakness. Roman antique was always associated with great affinity for wine. Drink allowance given to workers consisted either of wine or wine and huskus. More thorough consideration shows that the drink referred to as wine was a product made of waste with a low percentage of alcohol. For the majority of Romans wine was important on holidays, while in times of war or poverty wine became too expensive for many so that many more people drank only water. The most important social institution in ancient Rome was the feast which was mostly held at home in the sphere of privacy, and it represented a suitable moment to manage private, social and political events. It was important to have pleasant conversations and not to invite gloomy people, and apart from food, dancing and music played an important role. Integrative and most important part of the feast was the social component – associating during feast was more important than the meal itself. ”Socializing power of common food and drinks” which was introduced by the culture sociologist Georg Zimel, came to its full expression (according to: Hiršfelder, 2006: 87, 98, 90, 91, 240).

Social differentiation in eating existed throughout middle ages, but it primarily referred to the amount of food consumed which was noticeable larger with higher classes, because eating a lot was a sign of a high social status. In the 11th century the importance of church in shaping eating habits of people increased since it forbid eating meat for more than 150 days a year, and by doing that it encouraged the need for fish. Further through history, the invention of printing made it possible to store recipes, to spread cookbooks and table manners, and the commercialisation of eating in the 20th century and mass food production in cafeterias replaced „the established order of meals on the domestic table“ (according to: Hiršfelder, 2006: 112, 143, 157, 257).

Culture of eating represents extraordinary toughness -”when the basic food components become a barely enough, a person orients himself towards patterns made a long time ago” (Hiršfelder, 2006:226). The kitchen system therefore creates cultural, social, and primarily national, regional and local identity (Hiršfelder, 2006: 257). Touristic consumption represents an important factor in disposal of agricultural products, and the national cuisine and local specialties hold an important place in the tourist offer of a region (Mujezinović, 1987:41). Tourists are increasingly in need of typical food and drink of a region they visit. The world tourism has in the last 15 years included in the offer the wine segment and wine tourism is present in the most famous wine areas in Italy, France, Germany, Austria, New Zealand. Throughout history, wine conditioned economic growth in certain places in AP Vojvodina, and until today it has held its prestige and made this region recognizable in the world. (Pivac, 2008:7). The history of Serbian wine production goes way back in history. In the 8th and 9th

century, and especially during the rule dynasty of Nemanjići, Serbian rulers cherished the culture of wine growing. At the time of emperor Dušan, passed the law that applied to winemaking and its quality, and a wineglass in medieval Serbia represented an oath, law and a tradition. During the Turkish rule in Serbia, a great part of vineyards was destroyed, and during the Austro-Hungarian rule, wine growing became the most important economic branch, and Serbia became an exporter of wine for France. Wine growing and enology of Srem is one of the most important in this part of Europe. A Roman writer Aurelius Victor from the 4th century wrote that the Roman emperor Probus planted the first grapevine in Srem near Sirmium in 276 AD. Wines from Fruska Gora were especially appreciated in the 18th and 19th century, they were very high quality which is certified by a number of medals won at fairs as well as the writing of Dositej Obradović, Zaharije Orfelin and others. Wine areas Sremska Kamenica, Sremski Karlovci, Old and New Slankamen, municipalities of Irig i Maradić represent the wealth of Srem county. The vineyards in Sremski Karlovci and Irig today are still a great experience for the travellers (Pivac, 2008: 80, 7, 13, 81, 75). Cultural – touristic events related to wine (grape picking in Karlovci, Days of Pudar in Irig, etc.) hand in hand with natural, cultural and historic regions in Srem (Obedaska swamp, Zasavica, ethno houses, museum of bread) are important parts of a touristic offer of a region and represent a chance for tourists to meet the tradition and culture of a nation through food and wine.

Culture of eating in our nation as well as in others is a reflection of complex life conditions, „geographic and climate features, historical and social happenings in rural areas, therefore it differs from a village to village” (Đukić-Dojčinović, 2005:157) and often also from household to household. Culinary experience had a ceremonial character and the traditional ways of preparing food in rural households was motivated by the peasants’ need to express their gratitude to the nature for its gifts, as well as to express hospitality towards travellers. All of that makes rural cuisine specific and attractive for tourist demand, especially because in cultural life of village, as said by Đukić - Dojčinović, the food underwent the smallest changes. The reasons for this can be sought in the traditional division of labour which gives to women as "natural dowry"⁴ food preparation which is handed down through generations, and the culture of eating of rural population can be basis for developing a whole system of cultural animation (Đukić-Dojčinović, 2005:157-158), therefore rural cuisine represents an important element of a culture tourist offer of a country.

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Economics of agriculture

SI – 2

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THE TRADE WITH AGRICULTURAL PRODUCTS IN WTO AND POSSIBLE INFLUENCE ON TOURISM

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Abstract

This paper points out to a necessity of coordination between institutional reforms and efficient economic cooperation. The current state of our economy and tourist activity points out to necessity of needed reform. There are many interactions between agriculture and tourism, i.e. those which stipulate and supplement. There is very significant an attempt that tourism and agricultural production become export activities in every Balkan country, as transitional economies. Among comparative conveniences of agricultural and tourist product for performance at the world market, the agricultural product can also place on internal market, through an accommodation and non-accommodation consumption of foreign tourists on domestic economic space. There is great significance of agricultural products as strategic products, which effected that they were granted by strong subsidies in almost every country. However, by forming WTO has been set up new, quite precise rules in international trade of these products. It imposes a need to force „export“ of agricultural goods through foreign tourist consumption in the country. This paper aim is to show which effects would cause the acceptance of WTO rules in the field of agricultural products trade, as well as how could stimulate the production and consumption through the accommodation and non-accommodation consumption by the tourists. The paper was made by using comparative, analytical method and a method of case analysis.

Key words: *Organization, agricultural products, development, trade, influence, tourism.*

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Introduction

In current situation domestic agrarian sector is in, there ahead, without any dilemma, significant changes to it, in the process of accession to international integrations. Therefore Serbian agrarian sector should radically prepare for that. Globally observed, it imposes the obligation of more dynamic structural adjustment and reform of this sector. The most sensitive issue will be, surely, further liberalization of market, which has to be conducted gradually and carefully. The changes in subsidies regime and increase of home agricultural products competitiveness are also important part of those changes. In such moves belongs also institutional adjustment, because the adjustment of regulatory rules is also unavoidable activity for every country which pretends to join the European Union. In agricultural field should harmonize even 340 various documents and in all other activities, around 170 documents, which regulate the institutional adjustment.

It is well-known that WTO represents an international institution under which regulate relations between countries in trade field, on multilateral basis, in order to achieve as faster and more qualitative development as it can be. In that context is also the trade with agricultural products.⁴ It is important that the protection of internal market from import of agricultural products regulates only by customs. Hereby is more difficult the protection by other non-tariff measures. Therefore exactly the tourism gives a possibility to spend agricultural products on internal market at domestic prices, within the accommodation and non-accommodation tourist consumption. Therefore open new possibilities for utilization of agricultural potentials in tourism.

Participation of agriculture in domestic product

The participation of agriculture in DP, in Serbia, evaluates as very high. It is evaluated that, in transitional years, it has increased to 25% of participation in DP. However, it cannot be assigned to good condition in agriculture, neither to its high effects, but simply to a fact that other parts of the economy (especially industrial production) are in big crisis for many years.

Besides, false image creates total participation of agriculture (with 25%) and agro-industry (10%), with over one third of DP. The key issue is exactly high participation of primary agricultural production and very modest participation of food industry. It practically means that small part of agricultural production goes to processing. Then, there should take into consideration high natural consumption on agricultural husbandries. The following effect, in respect to low market activity, is small surpluses for export. Having all that in mind, should explore the influence of trade regulation of agricultural products on development of tourist activity and vice versa, considering them, in our conditions, not only comparative, but priority activities for further economic development of Serbia, too.

4 One of basic obstacles why GATT did not outgrow earlier in international organization was existence of export subsidies in the field of agricultural products export, as well as other instruments which have limited their free trade.

On the other hand, numerous problems come out from current state of domestic resources and agriculture, in general. The present state of the resources, in major part of productive chain, is unfavourable, which can be measured also by low competitiveness.⁵ However, after the research, should perceive which parts of sector have perspective, potentials, but the problem is also in adjustment period, in which Serbian agriculture would accustom to newly circumstances. There are parts of reproduction chain which should be protected due to potentially great economic and social distortions, as well as there are parts where the competitiveness could not be achieved. In any case, it is necessary to prepare more effective for accession to the European Union.

In comparison with other transitional countries can be perceived the influence of agrarian contract for each of them individually.⁶ There came to increase of agricultural products prices by subsidies cancellation, which has resulted, in combination with decrease of the population real income, with decrease of aggregate demand. On the other hand, foreign trade liberalization has resulted with increase of import. The increase of import was stimulated by:

- a) the consumers are willing to buy agricultural products which are not from domestic sources (e.g. citrus fruits).
- b) the consumers are willing to buy higher-quality products,
- c) foreign products are often cheaper.

Table 1. Participation of agriculture in DP of the following countries

Country	1991	1998	2005	2008
Hungary	7,8	5,8	6,4	6,0
Poland	6,8	6,6	6,6	6,2
Czech Rep.	6,0	6,5	5,3	5,1
Slovakia	-	6,6	5,6	5,3
Slovenia	4,9	4,5	4,2	4,1
Bulgaria	14,0	11,0	11,0	13,0
Romania	21,8	19,0	19,9	20,3
Russia	13,8	7,5	8,6	8,3
Ukraine	24,4	21,5	13,6	12,7
Macedonia	13,8	15,8	17,8	18,2
Yugoslavia	22,3	17,0	21,7	23,1

Source: „Transitional report“, 1999, 2009.

5 For example, the research which was done within SCEPP started from point that there should establish in which sectors was Serbia competitive and where the government, in future period, should not undertake some special interventions, while they can conquer the market themselves.

6 Together with change of economic and political regime, all countries have accessed the transformation of agricultural production, and by price liberalization in many countries were abolished or decreased subsidies. The reasons were: a) high budget deficit, b) WTO rules for decreasing subsidies for 20%.

In existing conditions, the only way to make up a loss of domestic aggregate demand is increase of agricultural products export. However, the position of agricultural producers in countries which are still in transition is not good: bad financial situation, obsolete fixed funds etc. cannot provide a competitive export according to WTO rules, which refer to export of agricultural products on internal market in form of tourist consumption.

Institutional regulation

Many assessments show that Serbian agricultural sector institutionally, organizationally and from the aspect of resources is neglected⁷ which has led to the loss of comparative advantages that Serbia had in comparison to other transition countries in the region. The reform, as one of the institutional problem of privatization, is fortunately not as severe as in some other countries, because Serbian agriculture was partly in private ownership during socialist period (however, many of the major farming systems, even after privatization, position very poorly, both in potential and competitive ability).

Then, institutional problems include those related to production and integration within the sector. Serbia has a large number of agricultural cooperatives which don't have the status of legal entity⁸. This is one of the reasons why contracts signed with processors are not being met, especially in terms of disbursement (it's always to the detriment of producers who suffer heavy losses). So, in Serbia do not exist, or do not work, trade associations and institutional reorganization is also awaiting this sector.

This means that the changes are necessary on macro level. Under the influence of market liberalization, much needs to be changed, especially production structure in favor of production which is competitive. Secondly, this includes the introduction of new technologies, also higher standards of quality and health safety of products, leading to more diverse and better offer. However, everything has its price and cost (especially when it comes to meeting standards of quality and construction and accreditation of laboratories). We should bear in mind that in some parts of production chain, especially in primary production, inevitable costs of production linking and organization of producers will interfere⁹. Taking all this into consideration, the most serious problem of agricultural production and the greatest limitation in increasing the competitiveness of domestic products will be the lack of (cheap) capital.

7 The agriculture nowadays suffers the consequences in terms of sanctions, state of war and disintegration of ex-Yugoslavia. It is familiar that this sector, during long-term period, has served as a mean for amortization of social crisis hits.

8 On the other hand, the cooperatives have lost position they had earlier, while the cooperative associations are estranged from the cooperatives and farmers whose interests they represent.

9 According to previous experience in harmonization of relation with the EU, in the field of agriculture, it is necessary approximately 5 years to realize first effects, after introduction of new regimes and policies. The experts of the EU have analyzed what effects it had at the level of land, agriculture, even farmers. On example of Slovenia was seen that its agriculture, due to previous high subsidies, above the EU average, had suffered damage in form of income decrease. In that sense, increased tourist circulation can be effective mechanism for its mitigation

Regulation of agricultural products trade

Agricultural products are, for most countries of strategic importance, and their international traffic is a specific and very sensitive to changes. Ending the Uruguay Round of trade negotiations and establishment of the WTO, set up new and very precise rules of behavior and defined obligations of member states in international trade in the area. An important innovation is to protect domestic markets from import of agricultural products regulated solely through customs regime. To implement this, the tariffication was conducted, ie. converting non-tariff measures into customs, so they consequently have the same effect. It is also prescribed to lower tariff rates in developed countries by 36% within six years period and in developing countries by 24% within 10 years. Reduction of tariff rates is not binding for the LDCs, and the "special treatment" clause allows some of them to maintain quantitative restrictions for certain "sensitive" products.

In many countries, for many years, it was common to subsidize agricultural production, often, very intensely¹⁰. Therefore, by defining "aggregate measure of support", WTO members committed themselves to reduce incentives in that area. Reduction obligations in particular referred to direct subsidization of export. For this purpose, calculations were made for all the products individually, to determine how much each of them was subsidized and how much the intensity of these measures should be reduced. LDCs are exempt from the obligation. Also, reducing domestic support obligation does not apply to those activities that have no greater influence on international trade. These are, primarily, government assistance in the areas of research and development, infrastructure, marketing, structural adjustment, regional development, environmental protection and improvement of disease control and food safety¹¹. Reduction of subsidies of agriculture, and consequently increase of certain product prices, with no doubt places the least developed countries that are net importers of food in difficult position. Therefore, it is envisaged these countries to be provided with assistance and help, free of charge, when needed, especially when it comes to basic foodstuff. The emphasis is also put on need for long-term help to countries in terms of agricultural development, while solutions of current problems sought support of the International Monetary Fund and World Bank, especially through the short-term loans to import food under commercial terms.

Multiple effect of tourism

With tourism development, money spent by foreign tourists represents additional costs, because the national income from abroad overflows into particular country of tourism, without contributing income outflow to the country it came from.

10 It was one of the most serious reasons why negotiations within GATT have realized so long and painful.

11 This element is very important in procedure of accession to the EU, and control of food safety is done in formed system of national laboratories. In Serbia no attention is paid to this issue, and it can jeopardize its negotiating position. The European Agency for Reconstruction has, for many years, the project which concerns exactly institutionalization of laboratories system for food control, but it still was not realized.

This is the main difference between export of goods, ie. visible export and revenues from foreign tourists, ie. invisible export. Achieved turnover (money) from foreign tourists not only circulates in tourist business but also through a sequence of other economic and non-economic activities, and this represents multiplied effect of tourism on the economy.

In respect of agriculture as the sector of economic (for which export is imperative to evaluation of comparative advantage), tourism is not in many ways burdened with transition transformations and can contribute to increasing export. In this sense, we should not, by all means, export agricultural products, but they should be realized on domestic market and offered to foreign tourists in meals consumption included or excluded in the overall price. We should bear in mind three elements:

- a) tourism has a comparative advantage in Serbia,
- b) nutrition is an important item of the tourist product,
- c) ecological and natural environment contributes to the increase of foreign tourists on the basis of rural and ecological tourism;

Table 2. Foreign-trade balance of agricultural products (in million USD)

Country	Agricultural balance
Slovenia	- 181
Romania	- 731
Albania	- 131
Lithuania	- 114
Poland	- 50
Slovakia	- 55
Czech republic	- 39
Estonia	- 10
Lietuva	65
Bulgaria	262
Hungary	1200

Source: FAO and "Restructuring Proces of the Food Production in Central and Eastern Europe", 2009.

In all the countries in transition, expansion of agricultural production will no longer be achieved through subsidies¹², however, the increasing tourist consumption of agricultural products by foreign tourists avoids all the regulations by the WTO, as well as hidden protectionism of the country (from which tourists originate).

This is achieved by:

- 1) improving the unfavorable trade balance of agricultural land;
- 2) improving the balance of payments by improving the trade balance (more agricultural products sold for foreign currency) and the improvement of tourism income (number of foreign tourists in the country);

¹² It is not allowed by WTO and, on the other hand, the quality is often used as hidden protectionism by import-country (e.g. the European Union).

Possible positive effects of this strategy and the necessity of their use are determined by current deficit of trade in agricultural products in countries in transition¹³ as well as negative trends in the tourism balance of Serbia. Mere presence of foreign tourists can reduce the "gap" of these products mostly by effects of foreign exchange currency (the high cost of consumption) and boost domestic agricultural production, stimulated by high prices. In the case of Serbia, the previous theory is valid if there is a positive balance of tourism, which is not the case. This means that the country must previously take measures to increase the inflow of foreign tourists in the Republic of Serbia, and then to use the multiplicative effects of tourism on increasing consumption of agricultural products and improving the trade balance. It imposes more precise operation of the tourism sector to the agricultural sector. Cross-sector analysis of the economy (efficiency of certain economic activities) is carried out through the input-output tables, it establishes connections and interdependence of industries and activities¹⁴. Although, in declarative form, tourism as well as agriculture in Serbia is considered strategic industries, so far cross-sector analysis of the multiplying effects of tourism has not been conducted.

Table 3. Participation of catering industry and tourism DP of Serbia

Year	Tourism (participation) (%)
1990	2,77
1995	2,37
2000	1,96
2001	2,11
2002	2,32
2003	2,45
2004	2,44
2005	2,30
2006	2,16
2007	1,93
2008	2,01

Source: Čerović, S., (2009), Strategic management of Serbian tourist economy, Želind, Belgrade.

Therefore, the elaborated thesis in this work on incentives to the tourism and agricultural production in Serbia, still has a hypothetical character, which we believe, has good elements, but should be verified by the scientific community.

13 The expectations that increase in prices of agricultural products will lead to decrease of those products import have not realized, because in some of them high coefficient of elasticity is present.

14 It is very complex and difficult activity and is done with support of state statistics; however, for needs of this modest research, it would be very responsible and complicated task, so it must be taken into consideration.

Instead of conclusion

From the point of joining the EU it is very important to renew talks on WTO accession and the central issue of these negotiations, when it comes to agriculture, is the tariff protection and its reduction (by the WTO rules are not defined by the level and range of allowable tariffs, but volume of reduction compared to base period). For Serbia, a very sensitive issue will be the one of subsidies, which hold quite a modest level and lower than in neighboring countries. With regard to export subsidies in the WTO there is a clear view that they should be repealed. As Serbia is not a member of WTO it can keep them for now, but the problem remains how to compensate them in the future. Possible mechanism may be increasing tourist spending for agricultural products.

The interdependence of trade in agricultural products and tourism is particularly evident in domestic front. Tourism provides with an opportunity to use agricultural products on domestic market by domestic protective prices under the meal including or excluding board and extra services of tourist spending. This thesis is based on the fact that in the very root of economic significance of tourism is basically the economic importance of tourism is tourist expenditure in places that tourists visit. Numerous studies confirm that tourism has an indirect and multiplying impact on the economy through effects of tourist spending. The point is to perceive these positive effects in agriculture as a strategic and a competitive activity in Serbia. That means less export of agricultural products, the unfavorable world prices, and spend more of the same, by the foreign tourists visiting tourist spots.

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UDK: 338.48-53:63 STARA PL.

THE ROLE OF MULTIFUNCTIONAL AGRICULTURE IN SUSTAINABLE TOURISM DEVELOPMENT IN THE AREA OF STARA PLANINA¹

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Abstract

The area of Nature Park and tourist region "Stara planina" owes the exceptional natural and cultural values on which base current strategic directions of economic development – tourism and agriculture. A significant ecological sensitivity and demographic and structural limitations of the area, emphasizes an importance of these activities sustainable development, which ensures their mutual support in realizing an integral regional development. The sustainable tourism presumes the development of complementary activities – agriculture, handicrafts and services, by promoting a consumption of local products and services and encouraging the employment of local population in tourism. The sustainable agriculture has multifunctional character and relies on the traditional production methods. The production of high nutrition value food, along with providing services of public interest and developing additional activities, ensures the environment protection and long-term sustainable management with natural resources and contributes to tourism development, employment growth, social cohesion and preservation of tradition and cultural heritage.

Key words: multifunctional agriculture, sustainable tourism, protected area.

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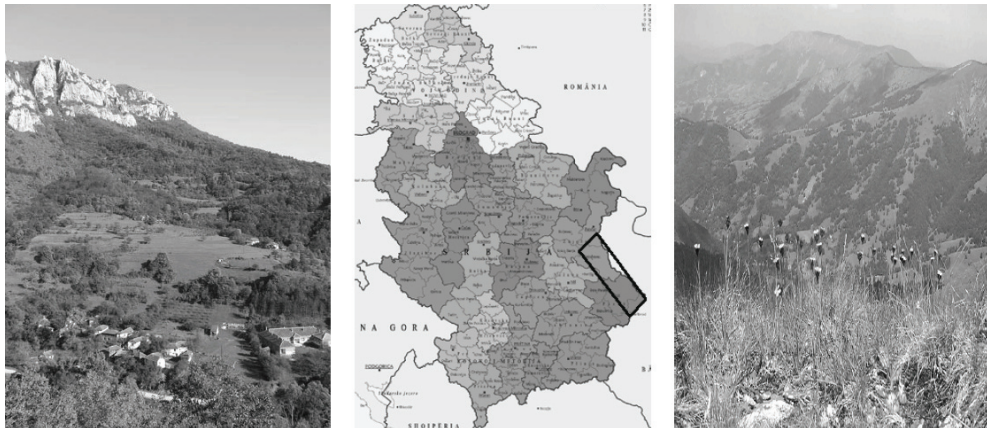
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Introduction

The area of the Nature Park and the tourist region "Stara planina" extends to 1542 km², alongside of Stara planina massif and sub-mountain surrounding, in northwest-southeast direction, ranging over parts of the municipalities of Dimitrovgrad, Pirot and Knjazevac and the city of Zajecar, in border zone with the Republic of Bulgaria, long around 100 km and wide about 4 km in the north, to 30 km, in the south.

Figure 1. Stara planina – mountain rural landscape and geographical position



Sources: <http://www.todimitrovgrad.org.rs/>; <http://commons.wikimedia.org/wiki/File:SerbiaPoliticalDivision.png>.

Generally, sparsely populated, this area of remarkable natural values and tourist potential gravitates to the road route of corridor 10 and its branch Niš – Dimitrovgrad - Sofia (E-75 and E-80), to the railway route of corridor 10 - Belgrade – Niš – Sofia and the Niš airport. Together with accession of Bulgaria into the EU and by decision of Serbian Government on significant investments in road and tourist infrastructure, in last few years has dynamically improved an accessibility and investment attractiveness.

According to the potentials and limitations of development, the Spatial Plan of this area defines **tourism**, **agriculture** and **entrepreneurship** as strategic priorities of economic development ("Official Gazette of RS" 115/2008). High ecological sensitivity and present demographic and structural limitations of the area emphasize the significance of sustainable development of these activities, which ensures their mutual support in realization of integral regional development.

The sustainable tourism establishes a balance of ecological, economic and social component of tourist development in realization of the environment protection, the growth of employment and poverty reduction and it is of utmost importance for protected areas. Stara planina was declared for the nature park in 1997 and was on the preliminary list of the UNESCO biosphere reserve (MAB). *The European Charter for Sustainable Tourism in Protected Areas* includes, among the basic principles of tourism development in these areas, the following key issue - "increase of benefits from tourism

to the local economy, by: promoting the purchase of local products (food, crafts, local services) by visitors and local tourism businesses, and encouraging the employment of local people in tourism" (www.european-charter.org).

In accordance to the Master Plan of "Stara planina" tourist destination, the development of tourism bases on creation of ski mega resort at the mountain, but also on creation of complete tourist values chain of wider space of Stara planina destination, including the tourism based on nature, culture and rural tourism (MERR, 2007: 73).

The multifunctional model of sustainable agriculture development, which keeps and improves the natural resources and biodiversity and develops production and processing of high quality traditional local products, rural tourism and handicrafts, provide strong support for sustainable tourism development. The sustainable agriculture in ecologically sensitive areas relies on the traditional methods of production, which ensures high level of ecological rationality, based on the use of local natural resources and knowledge, which carries over from generation to generation (Altieri, 2002). These production methods represent an excellent base for organizing an integral and organic production of food. Protected geographical indications and regional branding and promotion of the local products and services enable promotion of the area too, which contributes to entrepreneurship development, increase of employment and regional development (Popović et.al, 2009: 57).

The potentials and limitations for development of agriculture and complementary activities

Agricultural land

Natural pastures and meadows occupy 2/3 of utilised agricultural land and range over the mountain steppe, lengthwise of around 70 km and in width of 8,5-19 km. Although jeopardized by the processes of biological degradation, owing to insufficient utilisation, they dispose with extraordinary ecological and landscape values and economic potential for development of pastoral livestock breeding and production of milk, meat and manufactured products of special quality, resulted in specific geographical features. The most quality land is under vineyards (1,5%) and orchards (2%), in arable valleys, while sparse, but good quality arable land occupy 28%. Small and fragmented family holdings and slow process of restructuring and privatization of huge land areas in public ownership (44%), along with mountain relief and climate, represent major limitations for productive utilisation of agricultural land⁵ (Nikolić, 2008: 48-49).

Population and husbandries

The mountain villages have been affected by strong depopulation and decrease of husbandries number has not been followed by the property enlargement. High rate of activity has been a consequence of inadequate economic, age and educational structure of population on husbandries (table 1).

⁵ The average area of agricultural land parcel is 24,8 a, out of which: arable land 17,7, gardens 2, orchards 6,2, vineyards 9,8, meadows 24,5, and pastures 48 a.

Table 1. Population and husbandries – basic indicators

	Old M. area – total -	Out of that		
		Urban	Mountain	Other
<i>Agricultural population in total, %</i>	2,4	0,8	15,0	4,8
<i>Households with agricultural sources of income, %</i>	1,9	0,4	10,4	2,8
<i>Husbandries in total households number, %</i>	31,3	22,3	66,3	64,7
<i>Number of husbandries 2002/1991, %</i>	-20,5	-10,3	-31,3	-29,4
<i>Average size of arable land property, ha</i>	1,16	0,83	1,53	1,70
<i>Active in total agricultural population, %</i>	75,9	49,1	87,0	75,7
<i>Individual agricultural producers in population on husbandries, %</i>	95,6	80,0	97,6	93,5
<i>Number of active agricultural producers per 100 ha of UAA</i>	12,6	3,2	24,6	9,8

Source: SORS, Census, 2002.

The owners of husbandries do not realize incomes from agriculture, i.e. in most of cases, they do not even live on husbandry, which implies to a need of diversifying rural activities, in order to return young people to inherited, but abandoned properties and renew the agricultural production by assets earned in additional activities. There is expected that the development of tourism and complementary activities provides staying, return and permanent settlement of younger working population, at least when we talk about rural settlement with tourist functions (Official Gazette of RS, 115/2008).

Livestock and mechanization

The number and structure of livestock is far below the potentials of local feed production base, as well as regarding agro-ecological minimal norms for preservation of natural grassland, and points out to great possibilities of revival and development of mountain pasture livestock breeding (table 2).

Table 2. Livestock – basic indicators

	Old M. Area -totally-	Out of that*		
		Urban	Mountain	Other
<i>Number of livestock units per 100 ha of utilised agricultural area</i>	7,2	54,3	5,6	9,0
<i>Number of livestock units per 100 ha of utilised arable area</i>				
- totally	13,2	54,3	11,1	13,0
- family farms	56,1	21,7	94,0	55,5

* The place of living/census does not necessary overlaps with the location of husbandry
Source: SORS, Census, 2002.

The level of mechanization equipment is low, especially in mountain area. One duo-axial tractor cultivates approximately 22 ha of arable land, but along with extremely expressed spatial heterogeneity, so some mountain villages are completely deprived from power machines (SORS, Census 2002). In regard to heterogeneity of natural conditions is necessary a selective approach to the condition improvement in that field, with accentuation on modernization of livestock production by machines for feed transport and storage, as well as for milking and milk storage.

Infrastructure and investments

Poor technical and technological performances of husbandry are accompanied by low infrastructure and public services equipment level, especially in mountain villages. There is expected significant improvement in these fields by realization of planned tourist projects. In 2008, the investments (legal entities) in agriculture, hunting, forestry and fishery were absent in the municipalities of Pirot and Dimitrovgrad, while in the city of Zajecar were amounted 35,9 million RSD (84,7 thousand RSD per employee in agriculture⁶), and in Knjazevac municipality 10,3 million RSD (30,5 thousand RSD/employee)⁷.

The future development of agriculture and complementary activities

The agriculture and processing of agricultural products

The research done in 2007/08 for the needs of making the Spatial Plan of the Nature Park and tourist region "Stara planina", have shown that in this area can successfully produce many high quality agricultural products in the systems of traditional, integral and organic production (*sheep breeding – figure2*).



Source: <http://www.topirot.com/>



Processing these products (*like well-known Pirot caciocavallo, on figure 3*) and adequate protection and branding enrich area tourist supply and contribute to its recognition. These activities develop in the following micro-regions, depending on heterogeneous natural, resource, technical-organizational and social-economical conditions (Nikolić, 2008a: 19-21):

Source: <http://www.topirot.com/>

6 Those employed in agriculture, forestry, fishery and water management (companies and co-operatives) in 2008 (SORS, 2009).

7 In the same year, in municipality of Cajetina was invested 208,6 million RSD (1,2 million RSD/employee). On the territory of the Republic of Serbia was directed 21,4 billion RSD (431,2 thousand RSD/employee), out of which in Central Serbia 5,1 billion RSD (244,5 thousand RSD/employee) (SORS, 2009).

1. Timok fruit - viticulture region – it ranges over relatively densely populated zone of Zajecar-Knjazevac valleys and uplands and comprises 23% of the area's agricultural land, over 40% of arable land, 48% of vineyards and half of land under the orchards. The participation of household with husbandry is low; there dominate small holdings with non-agricultural sources of income.

The production should be oriented toward lesser number of bigger cattle and sheep cooperative farms in ownership of associated small farmers, directed to controlled use of mountain permanent grassland, which gravitates toward Timok, for livestock breeding and organized cooperative processing and placement of branded meat and dairy products. In parallel with that, the conveniences for integral growing of fruit and vegetables should be used. The area of Knjazevac is a part of south sub-region of Timok vineyard region and it is famous by top red wines, which geographic origin should be protected and the production of vine revitalized, together with development of wine tourism;

2. Pirot viticultural - fruit region – it occupies only 11% of agricultural land, but there are 22% of orchards and 48% of vineyards of the area. It is characterized by fragmented holdings, undeveloped livestock breeding and high participation of non-private ownership of land.

The preferential directions of investments refer to renewal of vineyards and wine production in this region, which belong to Nisava-South Morava viticulture region and has long tradition of quality white and red wines' production, with great potentials for development of wine tourism. The revitalization of traditional production of Pirot caciocavallo suggests the need for building lesser number of big sheep farms, supported by use of pastures which gravitate toward Pirot, and adequate processing capacities (mini slaughter-houses for lambs, mini dairies...). Small husbandries should be supported to orientate toward small production programs (autochthonous sorts of fruit, vegetables, honey, fish, etc.), production associations building and founding SMEs for collection, preparation, storage and distribution of these products and product preparations.

3. Knjazevac polymorphic region – encompasses northwest slopes of Stara planina and it is characteristic by heterogeneous production structure (11% of arable land, 3% vineyards and 7% of orchards, 7% of meadows and 7% of pastures), numerous small husbandries and traditional production methods.

Owing to the vicinity and partial stretch within the park's protecting zone, this area is especially favourable for development of organic production of autochthonous fruit sorts, rare sorts of grain and medicinal herbs and their placement under the trade mark of Stara planina Nature Park. Good results can be achieved also in development of traditional mixed livestock breeding, with dairy cattle as a leading branch and organized in common mountain grazing.

4. Grazing region – it comprises 71% of meadows, 72% of pastures, 30% of arable land and 21% of orchards of the area and ranges over mountain terrains of the municipalities of Dimitrovgrad, Pirot and Knjazevac, over 800 m above sea level. The basic limitation for sustainable use of these potentials is depopulation, which

alleviation is expected with development of the tourist resort.

In the field of agriculture the priorities are linked to a renewal of livestock grazing and strengthening of the organic production and protection of origin, especially sheep meat and milk and their preparations, in connection with processing capacities in city centres, where some villages, i.e. pasture series, traditionally gravitate to. The preservation of population density, sustainable use of agricultural land in mountain area with limited production capabilities and respecting the park's protected zones, mostly present within this region, should be compensated to multifunctional husbandries with adequate budgetary subsidies.

Rural tourism and old handicrafts revival

The traditional gastronomy, in distinctive, natural, cultural-historical and ethno-architectural environment, strengthens the development of catering industry, tourism and handicrafts. The multifunctional husbandries have real possibilities for development of entrepreneurship and/or realization of incomes in these activities, as additional activities on the husbandry and/or in rural surrounding.

The spatial plan of the area anticipates tourism development in, so called, tourist villages and villages in function of tourism. In tourist villages - traditional settlements, which development will dominantly lie upon tourism, was anticipated 9600 beds and engagement of 1450 employees in tourism⁸. In villages in function of tourism, as significant complementary activities (rural, agro-, hunting and ethno-tourism)⁹, was anticipated 3700 beds and 466 employees. The settlements: Temska, Topli Do and Visočka Ržana-Dojkinci in the municipality of Pirot; Kalna and Crni Vrh (municipality of Knjaževac); and Izatovci and Senokos (municipality of Dimitrovgrad) were anticipated for development of complementary activities - tourism and the local agricultural products concentration for organized supply of tourist resort and tourist centres and settlements in Stara Planina (Official Gazette of RS, 115/2008).

Besides wide supply of traditional specialities and local wines, activating old handicrafts should contribute to more complete tourist supply: kilim weaving – which originates from XVI century (famous Pirot kilims with autochthonous motifs and weaving techniques with the wool from Stara planina sheeps), traditional pottery (especially present in the middle of XIX century, also in Pirot) and making jewelry

8 Crni Vrh with hamlets Gravaljosa, Čuštica and Topli Do in wider surroundings of tourist resort, then Balta Berilovac and Vrtovac/Inovo (municipality of Knjaževac), Gostuša, Dojkinci, Jelovica, Rosomač and Visočka Ržana (municipality of Pirot) and Senokos and Kamenica, (municipality of Dimitrovgrad), with totally 3550 residents.

9 In villages near ski centers: Gornja Kamenica, Janja etc. (municipality of Knjaževac), Rsovc, Brlog, Bela etc. (municipality of Pirot) and Izatovci, Bračevci etc. (municipality of Dimitrovgrad); and out of the ski centers, in villages: Selačka and Mali Izvor (city of Zaječar), Cerova, Mirkovci etc. (municipality of Pirot), Baljevdol, Gornji Krivodol, Donji Krivodol etc. (municipality of Dimitrovgrad) and Ravno Buče, Radičevac, Novo Korito etc. (municipality of Knjaževac).

(silversmiths), which had been developed from Middle Age to the beginning of the XX century, then embroidery, etc. There should also add ethno architecture and ethno manifestations, where promotes rich spiritual inheritance of this region – music, food, folklore, customs ("Molitva pod Midžorom", "Sabor na Kadibogazu", "Sabor na Panadžur"...).

Figure 4. Old handicrafts and ethno-architecture of Pirot area



Source: <http://www.topirot.com/>

Financial support and cross-border cooperation

The financial support to development of multifunctional agriculture and sustainable tourism, except in authorized ministries, local communities can find in IPA supporting program to cross-border cooperation with Bulgaria.¹⁰ Serbia has numerous mutual interests and possibilities to cooperate with, in Stara planina region. Certain results were achieved within Euroregion "Danube 21" and "Eurobalkans", as well as within the SDC cross-border project "West Stara planina" (Jelinčić, Đurović, 2009: 63-64).

GTZ-KWD and MAFWM support activities of woman organizations for ethno inheritance preservation, in the frame of project "Ethno-inheritance of Eastern Serbia"¹¹

The preservation of globally important eco-system of Stara planina area is one of the project goals for Reforming Serbian agriculture in transition World Bank and GEF STAR Project.¹²

A condition for efficient use of these assets is organized cooperation at the local level. The associations of producers, clusters and local action groups have a decisive role in it (Popović et.al, 2007: 818-821, Tomić et al., 2009: 8).

10 The fund IPA CBC of the program Bulgaria-Serbia for period 2008-2011 amounts around 9.369 thousand EUR (MIPD RS, 2009/2011: 36); the first public call for project proposals was closed on 30.11.2009, while the other is expected to be at the end of 2010, <http://www.ipacbc-bgrs.eu/scc/news/view/22>.

11 <http://www.raris.org/vesti2010/07-31-10.htm>.

12 The bid of the MAFWM for submitting the preliminary designs for the projects, which are going to be financed through the Competitive Grants Scheme (CGS) within the STAR project, was ended on 13.06.2010, and deadline for finishing the selected projects is October 2011, www.minpolj.gov.rs.

Conclusion

Taking into consideration the available natural resources and cultural heritage of the Nature Park and tourist region "Stara planina", the multifunctional agriculture can give significant contribution to sustainable tourism, as basic developmental priority of this area. The inevitable precondition for successful realization of such developmental orientation is going to be realized partnership of wide circle of stakeholders at the local community level, coordination with appropriate actors at the regional and national level and active international cooperation, especially cross-border, with Bulgaria.

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Economics of agriculture

SI – 2

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POSSIBILITIES OF TOURISM DEVELOPMENT IN OPOVO MUNICIPALITY

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Summary

On the territory of Opovo municipality there are many kinds of natural (hydrologic, climatologic and bio-geographical) and anthropogenic touristic values (churches, galleries, monuments of culture). Most of the touristic values, both natural and anthropogenic ones aren't attractive enough for the tourists. Therefore we can speak only about the potentials for rural tourism development. Development of rural tourism gave good economic results in the countries of Western Europe. Surely, there is a great number of less developed countries or those in development that have lost the race of economic development to highly developed countries-and those countries see their chance in rural tourism development. Their main potentials are based on ecologically preserved rural area, anthropogenic heritage, natural resources and healthy food. Although country tourism has been practiced since the year 2000, the results are far behind the actual possibilities. However, there are expectations that nowadays' trend, which is in stagnation, will in the next period become a rising trend, considering the fact that tourist agency "Turist" is taking steps and specific actions to promote rural tourism development. The term rural tourism, as well as the factors influencing competitiveness of a touristic destination, is defined in this paper with an accent on ecology, environmental protection and sustainable development.

Key words: rural tourism, ecology, sustainable development

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Introduction

The World Tourism Organization defines the term tourism destination as “a space that has physical and administrative boundaries defining its management, and images and perceptions defining its market competitiveness. It is a congregation of private and public services with clear boundaries.”⁴ According to domestic authors, the definition of a tourism destination is “more or less defined geographic entity that offers attractive, receptive and communicative factors, i.e., all those natural, social, anthropogenic, cultural, historical, those concerning accessibility and other offers for accommodation, food, recreation facilities and visitors’ entertainment.”⁵ For tourism destination development, natural surrounding is not enough by itself, and additional tourism products should also be developed. It is important to combine these two parameters and thus increase competitiveness.

Physical and geographical characteristics

The municipality of Opovo is situated in South Banat, and it has extremely favorable geostrategic position (crossroads of 3 big market centers-Belgrade and Pancevo are only 30km away, and Zrenjanin is 40km away). It covers an area of 203 km² and has 4 settlements: Baranda, Opovo, Sakule and Sefkerin with the total of 11,016 inhabitants.



4 Source: <http://www.unwto.org>

5 Bakić O;(2002),Marketing menadžment turističke destinacije,Beograd

Type of soil

Chernozem (dark soil), the most fertile type in the Pannonia region, is the most represented type of soil, which favors intensive agriculture, so approximately 60% of population is involved in agriculture in relation to the total number of employed people.

Climate conditions

Moderate-continental climate prevails in the area. It is noticeable that autumn is warmer than spring. As far as winds are concerned, the most often one is kosava- south-eastern wind, and then there are the winds blowing from the Northeast and the South.

Hydrology

The area of Opovo municipality is rich in waters. The most important is the Tamis River, but there are also natural and artificial lakes, ponds and canals. The Tamis flows 29 km through the territory of Opovo municipality. Owing to these environmental conditions, there is a lot of sports fishing going on, so passionate fishermen both from nearby and far away surroundings (Belgrade, Pancevo, Centa, Grocka) come to the banks of the Tamis River on daily basis. They enjoy fishing and spending time in a natural oasis where they can find peace and relaxation away from the city noise. Apart from the Tamis, sport fishing is practiced on an artificial lake “Saran” (“Carp”) in Baranda. The coast is arranged, there are equipped spots for fishermen where they are protected from wind and rain. There is also an attractive complex of restaurants with domestic cuisine. The Tamis is a special locality exquisitely suitable for development of hunting and fishing tourism. Having that in mind, different activities for arranging the banks and completely equipping them for sports hunting and fishing tourism are planned in the near future.




The Tamis regatta

Flora and fauna

Forests take 1313 ha i.e. 10 % of the total territory of the municipality. Bigger forest complexes are found near the course of the Tamis. Those are mixed and partially autochthonous forests of poplar, willow, acacia and ash. The forests protect waterpower engineering objects from high level of water, they help decrease water wave and regulate climate factors (they reduce extreme temperatures and kosava wind blows). It is significant that the forests are situated near water and on the grounds not suitable for intensive agriculture.⁶

Natural resources give habitat for different animal species. In the forests we can find does, foxes, rabbits, pheasants, field partridges, quails and wild boars. Special interests of the hunters are wild ducks and wild geese on the Tamis and in nearby swamp areas.

Table 1. Wild animals in numbers

Does	192	
Rabbits	1470	
Pheasants	320	
Partridges	64	
Wild ducks	440	
Wild geese	60	
Wild boars	216	

Hunting trophies

Different and numerous wild animals are a precondition for an attractive weekend sports hunting. To have this type of tourism placed in the right position it is necessary to work on enlargement of the number of animals. Just the same, the local hunting society should be more engaged in promoting it.

Monuments of culture

The gallery "Jovan Popovic" was built in 1970 as a specialized institution for exhibitions. There are different kinds of exhibitions at the gallery throughout the year, from museum exhibits to modern art works. An art colony, a cultural manifestation which gathers artists from different parts of the country and the surrounding countries too, is also organized here. The gallery owns a collection of 177 works of art.

Serbian orthodox church-iconostasis, the work of Stevan Todorovic from 1895 and six icons from the second half of the 18th century (under the protection of the Institute Monuments).for Protection of the Cultural

⁶ Strategija lokalnog održivog razvoja opštine Opovo;(2007),Opovo,pp 13

Sakule: Serbian orthodox church-iconostasis of the choir and the throne-the work of Konstantin Pantelic from 1856

Baranda-Serbian orthodox church-the Throne Gospel by Lavov from 1690 (under the protecton of the Institute for Protection of Cultural Monuments)

Sefkerin-Serbian orthodox church-“Srbljak” published in 1761 is in the Serbian Orthodox Church library

Architectonic heritage

The building of an old school in the center of Opovo, covering the area of 1500m², is known as Villa Helena. It was built in 1902 and there are plans to adapt it and turn it into a museum.



Architectonic heritage, Villa Miss Helena



Archeological heritage, a figurine 3500 B.C.

On the territory between Opovo and Sefkerin there is an archaeological site, where some objects made of fired clay were uncovered (a figurine, altars, bowls) dating from 2500 B.C. These objects are presently in the depot of the museum in Pancevo, although there is an intention to have them exhibited in an adequate place in Opovo (villa MISS HELENA).

Historical figures

Jovan Popovic, a painter (Opovo 1810-Pancevo 1864)

He finished the Academy of Fine Arts in Vienna in 1842. He painted iconostases for the churches in Dolovo (Pancevo municipality), Crepaja (Kovacica municipality), and started working on the iconostasis of the church in Tomasevac (Zrenjanin municipality), but death kept him from finishing it. The gallery in Opovo got its name after him.

Stevan Milosavljevic, a painter (Opovo 1886-Pancevo 1926)

He finished the Academy of Art in Munich in 1905. He was a member of war

painters from the 1912 wars, and it was in that period that his best works were painted. He painted the iconostasis in Starcevo (Pancevo municipality)

Zoran Petrovic, a painter (Sakule 1921-Belgrade 1996)

He finished Academy of Arts in 1948 and worked as a full professor there until he retired. Apart from being a painter, he was a sculptor and a painter also. His most famous work is “Selo Sakule, a u Banatu”.

Borislav Jankulov, historian (Sefkerin 1878-Jasa Tomic 1969)

As a cadet of Matica srpska, he finished school in Budapest, history and geography major. In 1904 in Pest he got his Ph.D., and after that he worked as a full professor in Novi Sad. He is the founder of the Trading Academy in Pancevo, he also founded the City museum in Pancevo in 1919 and the city library in Pancevo. He was the founder of the first People’s University in the former state.

Olimpijada Pupin, born Milovanov, mother of Mihajlo Pupin, originates from Opovo

Dragan Mecavin (Opovo 1964-), a naïve painter

He is a member of Anthology of Serbian Naïve Art with his painting “Pastir trazi dno neba” (“Shepherd’s looking for the bottom of the sky”). He also painted “Pava”-the legend of how Opovo got its name. He has had solo exhibitions in Serbia and abroad. He is expected to give his best in years to come.

Manifestations

The most famous manifestation is “Shepherds’ days” in Sakule. This event traditionally takes place every year in March. Cattle breeders gather and prepare, and then taste domestic Banat cuisine specialties, there are also exhibitions of hand-made objects and the highlight of the manifestation is a widely famous donkey race. All these are followed by versatile cultural and artistic programs and many distinguished people from public life attend. Then there is a traditional art colony held every year on May 22nd at the “Jovan Popovic” gallery in Opovo, followed by the exhibition of the participants; there is a competition of sport fishermen, regatta on the Tamis River, and fiacre parade. The Country Olympics in Sefkerin takes place on August 4th, and it is also followed by preparation of some traditional dishes: stew, chowder and Banat strudel.

Accommodation

There is a “B” category hotel in Opovo with the capacity of 40 beds, 18 rooms and one apartment, conference hall with 30 seats, dining hall with 200 seats, aperitif hall and a terrace. In private sector the number of households interested in adapting rooms for accommodation is high and rising, especially near the banks of the Tamis River.



Hotel "Stari Banat" ("Old Banat")

Table 2. Accommodation and number of nights spent in a period 2007-2009

Year	Accommodation	Hotel accommodation	Private accommodation	Number of nights spent	Number of nights spent in a hotel	Number of nights spent in private accommodation	Average number of nights
2007.	88	40	48	652	86	566	7,4
2008.	96	40	56	568	62	506	5,9
2009.	101	40	61	609	73	536	6,0

Source: Tourist agency "Tourist"

Looking at the number of beds and the average number of nights spent during these last three years, it is noticeable that the number of nights spent in private accommodation is increasing. Why? Because people have a stronger need to spend time in natural surroundings that create the sense of relaxation, calmness and freedom opposed to life in the urban surroundings.

Table 3. Number of tourist facilities in the municipality of Opovo

Naselja Settlements	Number
Opovo	9
Sakule	3
Sefkerin	6
Baranda	1
Ukupno Total	19

Source: Strategija lokalnog održivog razvoja opštine Opovo; (2007), Opovo, pp28

It is obvious that people recognize country tourism as one of the profitable activities that is on the edge of expansion. We hope that after the realization of the SPA center in Baranda project, municipality of Opovo will become the leading destination of health tourism in the region.

Sports courts

For sports and entertainment in Opovo, there is a football court, a basketball court, a volleyball court, a tennis court and an athletic running track. During summer months football, basketball and volleyball tournaments are organized and held here. With an intention of contributing to development and popularization of sports and recreation tourism, as a part of a tourist offer of the municipality of Opovo, building a sports recreation center is in plan, and the location has already been found.

Health and treatment offers as touristic potentials

On the territory of Opovo municipality there is a deposit of mud bath in the settlement of Baranda, 3km away from Opovo. The results of different analyses point to a great opportunity and validity of opening a spa health resort. The complete research was done in the central laboratory of NIS NAFTAFAS in Novi Sad, and the opinion of therapeutic value and indications for its use was given by the Institute for Rehabilitation-department of balneo-climatology in Belgrade. Mud baths can be used as a healing agent for the following diseases: degenerative joint disease, extra-articular rheumatoid arthritis, inflammatory rheumatism in early stages, conditions after bone breaks and traumas, chronic illnesses of genito-urinary tract.⁷

Conclusion

Analyzing all the above mentioned parameters, basic and additional contents, environmental conditions, climate, hospitality of people and geographic position, the municipality of Opovo, although the smallest one in South Banat, has all preconditions needed to become an attractive destination of Banat rural tourism. But what are the reasons it hasn't become one yet?

- Local political willingness does not exist, the politicians do not recognize the values of this territory enough to valorize it on the market
- There aren't enough marketing activities that would promote existing facilities and be a connection with potential investors who are willing to build here

Local tourist program, in order to be realized, has to be supported:

- Financially (by the local self-government, secretariat, ministry)
- Fiscal (tax relief and benefits when getting means and equipment)

⁷ The author was a member of the working group which was engaged in making a general design of a spa complex "SPA Center" in Baranda in 2008.

On the other hand, why do tourists return?

Tourists return because for most of them spending time here is an escape from the urban jungle, it is refreshment and the way to “charge batteries”. But it is also more than that. By being in touch and making friends with the locals, classic boundaries of tourism are broken, intimate atmosphere is created (as opposed to hotel atmosphere) and the guest feels as at home. For the guest it means returning to nature, for the host it means broadening horizons through impregnation of the traditional and modern. It is revival of the country, it is overall development

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Economics of agriculture

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TRADITIONAL FOOD AND ITS IMPLICATIONS FOR DEVELOPMENT OF RURAL TOURISM IN SERBIA

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Abstract

Analysis is based on qualitative research. Two focus groups were conducted. Paper examines differences between urban and rural participants' perception and image of traditional food and possible implications for rural tourism development. Analysis confirms positive image of traditional food both in rural and urban group. However, regarding perceptions several differences appear (in terms of variety, availability, home made or processed, quality control system and labeling). Authors argue that level of utilization of these concepts in further development of rural tourism will to a large extent depend on perceptions and image of final users of rural tourism services (urban population).

Key words: *Traditional Food, Concepts, Image, Perceptions, Rural Tourism.*

Introduction

Exploring the linkages between agriculture, traditional food and rural tourism development

Agriculture plays a special role in the concept of sustainable rural development and it is observed as traditionally the most present activity of rural economy. Natural, human, manufactured, financial and local resources are all engaged in creation of rural economy. By means of politics, procedures and institutions, these resources are transformed not only into food as a visible product, but also into employment, welfare

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of local community, clean air and healthy environment (*Kahn, 1998*).

The initial phase of rural development is often seen as the agricultural based. It means that only directly linked activities with agricultural production can be considered as factors of the local rural community development, such as rural tourism (*Torres, Momsen, 2004; Knowd, 2006*). However, rural tourism is currently not yet sufficiently structured and organized in Serbia (*Strategy of Tourism Development, 2006*). If one bears in mind the specific position of underdeveloped rural economy, then it is definitely necessary to investigate the perspectives for further valorisation of traditional food as an integral part of the offer that can create added value for rural regions. Furthermore, understanding the consumers' image and perception towards food products that are traditional and typical of a certain region can provide useful insights on further sector development. Exploring the ways in which consumers perceive and value traditional food usually draws upon results of exploratory qualitative research - consumers' understanding traditional food to be a complex dynamic of interrelated concepts (*Skuras, Dimara, Petrou, 2006*).

Traditional food is generally related to very long history, local culture and eating habits learnt from the past (transmitting knowledge from generation to generation). However, the quantity of traditional food available at the market heavily depends on the size of production area and efficiency of short distribution channels (*Alkon, 2008*). Local availability of the given product is a key element for its supply. Traditional food is mainly defined by human-related factors (*Barham, 2003; Dixon, 1999*). Contemporary understanding of traditional food in Europe is also referred to the concept of typical food of the region. Consequently, the concept of regional food is strongly related to the Geographical Indication labeling policy (*Giraud, 2008*). However, export of traditional foods are deemed to be scarce. There is some evidence that export of traditional foods is provoked only by immigrants' communities (*Verbeke, Lopez, 2005*). It seems that traditional food is more local or interregional oriented. It can be concluded that increasing of demand for traditional food (and agricultural production as well) can be provoked by integrated approach to rural tourism development.

Method and research questions

Analysis presented in this paper is exploratory in nature. To determine the perceptions and image of traditional food in Serbia qualitative research method was implemented. The research is based on the focus-group discussions (FGD) conducted in urban and rural region in Serbia.⁴ The first FGD was held in capital city – Belgrade with urban population, and the second in South-East Serbia – Zajecar with rural participants. Total of 18 participants were interviewed (10 and 8 respectively). Participants were selected by chance through screening procedure, using recruitment questionnaire.

⁴ The research is implemented in the frame of FP7 Focus Balkans - Grant Agreement no.212579. The study was also related to the implementation of the Project 149 007 - MSTD of Serbia.

Respondents were responsible for food shopping selected so as to vary in age and gender.

What the paper seeks to analyze in particular are rural-urban differences in respondents' image and perception of traditional food in Serbia. The analysis refers following research questions: (1) What are urban and rural respondents perceptions of traditional food? How is the traditional food concept understood in Serbia? Are there any differences between urban and rural participants perception of traditional food? (2) What is the image of traditional food in Serbia? Are there any differences between urban and rural participants regarding this issue? (3) How is traditional food concept supportive to the rural tourism development in Serbia? Can the image of traditional food be converted into qualitative tourist offer? Are there any indications among urban population that can support overall rural economy development by traditional food consumption and rural tourism development?

Findings and discussion

Perception of traditional food

Understanding perceptions of traditional food firstly addressed what types of products/dishes our respondents considered traditional. Therefore, participants were firstly asked to list five food items they perceived traditional (non-aided cognitive responses). Their spontaneous evocation of traditional food mostly included typical dishes and food products frequently consumed at their homes such are: *beans, sarma, cabbage, green beans, peas and potato, diary products such are cheese and kajmak, pies and cheese pies as well as corn flower made dishes (kacamak and proja)*.

Overall, the differences among our respondents as well as between the two focus groups were hard to notice concerning this issue since all the above listed traditional dishes and products were mentioned in both focus groups. However, particular dishes were more frequently mentioned by the respondents in those focus groups (eg. beans in rural and sarma in urban). Another interesting point is that *ajvar* (traditional Serbian dish) and *belmuz* (typical for the region where the rural focus group was held) were not frequently mentioned.

According to their discussion on the products they were asked to list as traditional while providing the explanation for their choice of typical traditional products in Serbia we were able to recognize several different concepts of traditional food, namely: 1) traditional food as home-made (hand-made) food, opposite to industrial products/dishes, 2) traditional food as food prepared and consumed by many different generations 3) traditional food as locally produced/grown food 4) traditional food as food exclusively produced and consumed in Serbia 5) traditional food as food evocating emotions – food made in our childhood, food made in villages by our grandparents, food consumed in a family and food connected with social events. While all the five concepts may be found based on our respondents' discussions in both focus groups, most of participants in the rural focus group seem to have been particularly stressing traditional food as healthy

food due to its controlled natural ingredients and no additives and preservatives. The typical statements are listed below:

“I have regarded traditional as something domestic (i.e. home-made), without additives, e.g. Zlatibor cheese. And mild cheese as well however rather that bought at a green market not packed like this one.” (Female, urban); *“I selected kajmak, cvarci and slatko since they are usually home-made, not imported and I consider those a healthy food. Industrial products may also be made in Serbia, however I don’t see them traditional, and I rather consider natural products to be traditional.”* (Female, rural)

Our respondents mostly associated traditional food with *village, family, and heritage, frequency of consumption, home-made food, tasty food and healthy food*. The following statements support all these concepts:

“Present and produced in villages – kajmak, kacamak, beans.” (Male, urban); *“It is my mother’s cuisine.”* (Female, urban); *“It has always been on the table – for example cheese.”* (Male, rural); *“Our production – home made. It is more tasty when home made.”* (Female, rural)

Positive perceptions of traditional food are mostly as follows: natural, not genetically modified and therefore healthier food that also tasted much better than any other kind of food. Our participants in the rural focus group have particularly stressed the concept of healthy food related to traditional food. It is perceived positive since it is made of natural ingredients, home-made and controlled since obtained from own fields of reliable farmers, not containing additives and preservatives.

“The main quality is taste. It is the tastiest food.” (Female, urban) *“It is with many colors – colorful.”*(Male, urban); *Our Serbian traditional food is well-known. All those who come to visit us are amazed with it. It tastes different, it is tastier.”* (Female, rural); *“A home-made food doesn’t contain seasonings and preservatives. It is healthier.”* (Male, rural)

On the other hand, in both focus groups healthiness has also been seen as the most negative aspect of traditional food which is also considered to be unhealthy due to its fatness, high caloric values and low diversity of ingredients, especially healthy nutrients.

Image of traditional food

Regarding the image of the traditional food certain differences among our respondents as well as between the two focus groups were noted. Both urban and rural participants consider traditional food healthy or at least healthier than other industrially produced food. For rural participants the image of traditional food is homemade, domestically prepared/produced food. However, for the urban group the image is food without pesticides, additives and artificial components.

The most common association of health dimension of the traditional food for the rural participants is related to its diversity - the wide variety of traditional products and dishes produced and offered at the market. However, all respondents consider Serbian traditional food overwhelmed with meat, full of fat, prepared as grilled, roasted or fried. The latter was particularly emphasized female participants. Also younger participants consider traditional food not to be particularly healthy.

“The best indication that the traditional food is healthy is that people in rural areas are healthier than people in the cities. For the healthy diet it is equally important adequate physical activity. Very often we can see that old people in villages eat cheese, polenta, corn bread, beans and drink one glass of rakija and they are long-lived. The rural population used to come to town in our past, and now they are returning to the countryside.” (Male, rural)

As a part of its image among rural participants particularly, traditional food is considered to be more natural than other types of food. However, they argue that some ingredients (chemicals) are the inevitable part of the agricultural production process. The products produced out of season (e.g. in greenhouses) are considered full of chemicals and not natural, and consequently, not so healthy.

“Some products are natural. All products collected in nature - wild apple, blueberry, etc. We make jam from them and so on. They are completely natural. Villages in the mountain area focused on the natural pastures have natural cheese, cream and milk.” (Male, rural); “There is no natural food; nothing else left that might be clarified as completely natural. But it is more natural than other foods certainly.” (Male, urban)

The rural participants also consider the traditional products/dishes as high quality food. For the urban participants quality equals trust both to the product origin and producer. Both urban and rural participants argued among themselves that traditional home-made was of a better quality than industrially prepared. The discussion among urban participants lead to a conclusion that the price might best serve as an indicator of the quality of the traditional food – higher price indicates higher quality of products available at market.

“Yes, they are high quality products. We are from the village. When preparing for yourself and your family or friends, it must be delicious.” (Male, rural); “It is a geographical area; I have more faith in the products that are from a particular region.” (Male, urban); Compared to the industrially produced products they are extremely of high quality - it also may depend on location of the production and environment and so on.” (Male, rural); “Yes they are, but only when they come from domestic, personal production.” (Female, urban)

Both rural and urban participants agree that in each country it is well known which region produces the best quality food. In that context the origin of traditional products is considered as an important characteristic. The rural participants perception of the traditional food is more locally oriented opposite to the people in the urban -

capital city, who had the idea only about the traditional products available at the market (both green markets and supermarkets). During the discussion the rural participants insisted on legal protection of Serbian traditional products in order to avoid their protection by the other countries in the region as their own.

Conclusions and recommendations for further research

Perception and image of the traditional food discussed in this paper suggest rather high impact of these products on rural tourism and local economy development. However, level of utilization of traditional food will to a large extent depend on the perception and image of these products particularly among urban population. Based on the qualitative study, we may derive several tentative conclusions on the implications of traditional food image and perception on overall rural development and in particular rural tourism development.

The perception of traditional food is related to several different concepts, all of which may make a sound basis for developing promotional strategy of rural tourism among the local population in Serbia. Associations to traditional food such are *village*, *family and heritage* as well as *home-made food* evoke positive emotions which could also be conceptualized for the purposes of rural tourism promotion. On the other hand, associations such are *tasty food* and *healthy food* are primarily connected with positive perceptions of traditional food among our respondents.

Regarding image of the traditional food, our general finding is that the participants consider it healthier than other kinds of food. However, two concepts of healthiness have been distinguished, i.e. natural (not artificial, without preservatives) and tasty and fatty food. There seem not to be any significant differences regarding the natural character of traditional since this was particularly stressed in both rural and urban FGD. Additionally, rural participants perceive taste as an important element of the traditional food quality. However, regarding other part of the as healthy food related to the patterns of consumption and its high caloric value. In that sense, women seem to be particularly skeptical about the health benefits of traditional food than man.

The rural participants knowledge on the traditional food is more locally oriented opposite to the people in the urban - capital city, who had the idea only about the traditional products available on the market (both green/open market and supermarkets). It could also indicate the level of traditional food recognition on the national market. Only products with sufficient supply for the large market segments are recognized. Therefore, local producers should be supported to establish cooperatives to strengthen their market position and promote their food products while simultaneously contributing to the promotion of touristic offer of their regions. In the same way, they should be supported to apply for the label of geographic origin which make highly relevant information as well as a certificate of high quality for both for domestic and foreign consumers. Moreover, the fact that these products can represent the regional tradition not only to Serbian but also foreign tourists could be implemented in the overall strategy of development of rural tourism in Serbia. However, any further discussion

on the usage of traditional food in Serbia as central point of rural tourism promotion directed at foreign tourists calls for a broader research and analysis. In consequence, the findings analyzed here are primarily relevant for utilization of traditional food in rural tourism development and its promotion among prospective Serbian tourists.

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RISK MANAGEMENT IN RURAL TOURISM

*Snežana Štetić*¹

Abstract

Tourism today presupposes an integrated quality of facilities and services for its development, as well as the total quality of tourism products offered to consumers. The risks that arise in every step of creation, promotion, presentation, marketing and sales of rural products have a constant influence on the growth and development of rural tourism market. People create the needs not only considering the change in life and learning about other cultural goods, but also the need for isolation in order to achieve better health, psycho-physical state and stability. Regions that attract many tourists are rural areas. Rural areas could be classified in the category, as well as ecological and protected areas and places that can meet cultural and recreational needs of a visitor. As we know, tourism is sensitive to all negative phenomena in the natural environment, as well as in social events. In the era of terrorism, global warming, natural disasters and hostilities that govern the world we have to understand that the time of safety and security is the past. Therefore, for the development of tourism in rural destination it is extremely important to envisage all the weaknesses that occur in the field of safety and security.

Key words: *risk management, rural destinations, integrated quality of space, environment, terrorism*

Introduction

Tourism is very sensitive to all negative phenomena with both, natural environment and social events. For the development of tourism in a destination it is extremely important to perceive all the weaknesses that occur in the field of safety and security. Let us list some that can be used by not well-intentional visitors. These are (Štetić 2003):

1. Under-developed network of security in a destination;

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2. Poor training of local residents;
3. Desire for foreign currency inflows without adequate control (money laundering);
4. Inadequate involvement of local people in tourism development;
5. Different economic development of local community and the countries of tourist demand;
6. Developing illegal forms of tourism (poaching, sex tourism ...);
7. Inappropriate behavior of tourists (as opposed to customs and religion of a local community);
8. Infiltration of terrorists into the local economy;
9. Inability to control mass tourist traffic and seasonal labor in a tourist destination;
10. Tourism becomes a "cover" for terrorist activities...

A tourist destination is only a fraction of the space when it comes to terrorist activity. Let us recall only some countries and tourist destinations where terrorists acted in the last decade of the twentieth and early twenty-first century and carried out their attacks: the USA (New York), Egypt (Cairo, Sharm el Sheikh ...), Israel, Spain (Madrid), the United Kingdom (London), Kenya, Algeria, Bali, Morocco, Russia, Philippines ... The list is, unfortunately, much longer with more and more victims. Considering all these countries, it can be noticed that they are on different continents, that they have different kinds of tourist destinations (city tourist centers, centers of photo safari, residence tourism, pilgrimage, cultural tourism ...), different religions... but have one common trait: they are popular tourist countries and developed tourist destinations. This is exactly what terrorists need: great popularity and publicity for their purposes, regardless of the type and amount of human casualties and material damage. Actually, their main motto is "*the more ... the better ...*".

Everything is changing. The bases for tourism development are not only natural and cultural resources, but above all security. To achieve this, we need to talk about security strategy in tourism and create safe tourist destinations. In order to create a safe tourist destination we must pay attention to:

- Security of all tourists and visitors;
- Safety of employees in tourism and other activities;
- Security of space;
- Environmental security;
- Economic security;
- Creation of a positive image in the field of security.

This means that every country which in the future wants to be on the world tourist map must know and be able to put into practice the basics of security in each and every tourist destination in the country as a whole. The task is neither easy nor simple. Therefore, that is why we especially talk about the implementation of "Risk Management" in tourism.

The questions are being posed: "What about tourism, about tourist destinations? Are the risks the factors that will make future directions of the development of tourist destinations?" The fact is that a tourist destination without recognizing the risks and their prevention cannot talk about further development of tourism in the destination.

The new rural development policy of the enlarged Union (EU - 27) implies the elaboration of different models of development according to specific conditions and needs of the territory. This is achieved by the appropriate adjustment measures, and for Serbia it would be very important (Todorović, Štetić 2009):

- ✓ to increase the competitiveness of supporting the restructuring of the agricultural sector;
- ✓ to improve the environment and natural landscapes through land management
- ✓ to diversify rural economy;
- ✓ to improve quality of life in the countryside;
- ✓ to give support to implementation of local strategies for rural development
- ✓ Implementing LEADER approach.

To identify innovations in terms of rural development is not an easy task, considering that it depends on the spatial, economic, productive, social, cultural and other factors. In this sense, rural areas are faced with the need to use new opportunities, which certainly is not always easy to recognize and requires commitment, creativity and a new view on resources. In this sense, the realization of the LEADER² program concept can facilitate understanding of the general platform of rural development.

Risk management in rural areas

Rural tourism destinations are facing increasing challenges in the domestic and international markets. An increasing number of the world's population creates a greater impact on the environment and social background. The success of tourism development in rural areas depends on the ability of local communities and destinations to attract as many tourists as possible and to preserve resources for future generations. (Bramwell 1994, Štetić 2003). According to that, we can say that tourism can be developed in rural areas where population recognized importance of tourism.

Destination development is the key to preserving natural and cultural resources on which tourism depends (Štetić 2001). Therefore, the interaction among public sector, tourist destination marketing, private sector and local communities is extremely important. In this way, all the participants together can more effectively manage local - global influences in their natural and cultural resources. The effective development of a rural tourism destination is an important prerequisite for the development of certain parts of the country.

Safety is a priority issue when tourists visit a rural tourism destination, or when they take part in picking products or other activities on the farm, or when they visit a farm. Customers' safety is largely the responsibility of the host and the members of his household. Therefore we must be aware of the risks and make risk assessment of rural

² (French: Liaison entre l'action pour le développement de l'économie rural; English: Links Between Actions for the Development of Rural Economy)

households or a facility in ecotourism and prepare them for safe and pleasant visit and stay for tourists.

Rural tourism is a mutually beneficial exchange between farmers and residents of urban areas. On one hand, farmers learn about the city's needs, on the other, the inhabitants of the city destinations are enabled to learn about farms and enjoy the outdoors. Also, farm income is increased if the entrance to the farm is charged, or if products are sold to visitors. However, visits to farms carry some risk, as well as the potential responsibility of the owner of the farm in case of accidents or visitors' injuries. Therefore, there is a need to apply responsibly strategies for risk management in order to reduce risk exposures to a minimum.

The spaces that encourage the development of tourism require the creation of detailed development plans and certain investments, so that tourist visits reach its maximum from year to year (Čomić, Kosar, Štetić 2001). Local destinations include different segments of tourism offer, shareholders and those who invest to form larger destinations. Destinations may be different in rank, ranging from those covering the whole country (e.g. Serbia), a region (eg. Eastern Serbia), a mountain (e.g. Stara planina), a village (e.g. Knić) or urban or isolated areas (e.g. Kalemegdan or Sirogojno).

The new concept of tourism destination management (Štetić, et al 2009) adopts a system where environmental, physical and social factors are linked to different networks and institutional structures. Traditionally, the management of rural destination should represent interests of local communities. Their mission is to develop the village and create the image of rural destinations in order to attract and increase the number of visitors. (Roberts , 2001). Therefore, rural destinations, countries and travel agencies should focus their advertising campaigns on tourism activities. A rural tourism destination that wants to take a good position in the domestic and international tourism market should be guided by basic principles of sustainable development while respecting the demands of clients for the highest quality of offered resources and services. For that reason, the research and evaluation of rural tourism destination management must be very carefully and deliberately approached. If all participants are acting together in determining what they really want from tourism and what way they want to place it, they will all be better off (Butler, Hall, Jenkins, 1998).

Risk Control and Reduction

One of the essentially important tools in the fight against risk is insurance on responsibility (Page, Getz 1997). Before rural destination start receiving tourists, they have to check security of rural destination, then the host should:

- identify the places that the guests visit, the activities in which they take part, how they will be monitored, precautions to be taken, and all rules of conduct and warnings should be put in visible places;
- plan emergency procedures and always have a box with a well-equipped first-aid on hand; a plan for the procedures in case of natural disasters such as earthquakes, floods and fires should also be developed;

- recommend visitors to wear the appropriate footwear (closed-toes shoes, sneakers or deep shoes, rather than sandals) and clothing;
- provide guests with special instructions, and explain to them that it is a farm household; since some accidents always go with an area (uneven ground, insects, climate, odors), the visitors have to accept any such risk, and exercise some precaution measures;
- clearly mark the places which are not allowed for visitors, and sites that are designated for visitors; fence in other parts or block access to them if they may be dangerous for visitors.

Facilities and equipment in rural destination

In planning tourism development on a property it must be taken into account that it has adequate space and the facility equipped to provide quality services in rural tourism. Therefore, the space that will be used by visitors for various purposes must be well planned.

- In most countries it is required that cars *are parked* in a special place, off-road.
- If *buses* must be parked away from the property, plan the places for it
- Are there clean, well-equipped public toilets in use? If not consider renting portable toilets.
- *Security*: Depending on the type of activities or events in rural destinations, you may need to hire extra help to work in order to eliminate any possible danger to visitors.
- Always leave *ladders* away from trees and public spaces in order to avoid attempts to climb. This applies particularly to younger visitors.
- *Parking tractors and attachments* within sight, but beyond the area intended for visitors. Agricultural equipment is something that fascinates people, however, tractors often become objects to which children climb .
- *Pesticides, herbicides* and other products intended for use on the farm should be safely stored, in a safe place, away from public areas.
- *Craft workshops* and repair shops are among the most dangerous areas and therefore the access to such places should be limited.

Animals in the rural destination

Any contact with animals must be monitored for the visitors' safety. Animals often change behavior when they are surrounded by a group of people or when strangers approach them. Animals should be in a confined space with limited access for visitors, and each physical contact should be monitored. Problem can be odors, ventilation, manure, flies and pesticides in the parts of the farm where visitors might get behind.

Only a very calm and friendly dog can be close to visitors, and they should be warned that puppies also have sharp teeth so that they can cause injury or make some damage. Cats and kittens have sharp claws and teeth.

Goats and sheep are increasingly being used as the animals that visitors can touch. Since they are ruminants and have no upper front teeth, visitors can more safely

feed them out of hand than horses that have upper teeth.

Geese can be very aggressive. Chickens, ducks and other poultry are suitable for feeding. *Cattle* and calves should be in a separate box for grooming, also manual milking of cows is not recommended.

Horses and ponies can bite. Riding horses and ponies require special rules, safety precautions and insurance.

A *sign* with the inscription: "Wash your hands after contact with animals" should be put and a place and means for washing and drying hands or a device for sanitation should be provided.

It is especially important to take care of water bodies, so that their visitors do not get too much closer to well, pool or pond, and to pay attention to children irrespective of whether their parents are present.

Rides on a trailer with hay are extremely popular among rural visitors, so extra precautions should be taken. For this activity you need additional persecution. Maximum number of people who can simultaneously be driven safely on the trailer should be determined. All participants in the ride should obey some rules: not to smoke, to sit during driving and to remove their feet away from the wheels. Tractors should not move faster than the speed of an adult who runs an easy pace.

Conclusion

We are witnessing the risk of life and risky experiences, not only worldwide but also in our immediate vicinity. Often we do not think about them until these sporadic events turn into a crisis. However, is this the right way of thinking and acting when considering tourism and especially a tourist destination? The old proverb says, "*Prevention is better than cure*".

The basic motivation that drives millions of people to engage in tourist movements are rest and recreation, natural motifs, climate, cultural and historical monuments, history, customs and folklore. Studying the development of tourism, we have perceived its regional distribution and selection of destinations according to segments of tourist demand. This affects the creation of certain tourist macro, meso and micro regions. When considering rural tourism, these regions are usually studied at the micro-level because of their disconnected and sporadic occurrence.

In addition to famous tourist destinations, more and more new potential or just developed tourist destinations sprout. By their attractive, receptive and communicative factors, together with the development of local communities, they begin to include in tourist flows. Many of them are in rural areas and according to their potentials start to develop different forms of tourism. Through valorization of individual elements or total resources that are on disposal of rural destinations, specific tourist destinations are created.

By presenting only a small number of requests and problems posed in the management of risks in rural tourism with the objective to develop and place it, we have just raised a very important topic for further tourism development. However, as always,

there are different opinions about the importance and predominance of certain issues in relation to others. What is certain in the development of rural tourism destinations are the problems and risks that need to be overcome and resolved.

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Konsultantske usluge implementacije ISO i drugih medjunarodno priznatih standarda, alata i tehnika, koji se bave pitanjima obezbeđivanja, kontrole i unapređenja kvaliteta i zdravstvene bezbednosti hrane.

- ✓ *ISO 22000*
- ✓ *HACCP Sistem*
- ✓ *IFS*
- ✓ *GLOBAL G.A.P.*
- ✓ *ISO 9001*

Ostali standardi, alati i tehnike iz konsultantskog portfolia:

- ✓ *ISO/IEC 27001*
- ✓ *OHSAS 18001*
- ✓ *ISO 14001*
- ✓ *ISO/IEC 17025*
- ✓ *ISO/TS 16949*
- ✓ *FSC CoC*
- ✓ *CE znak*
- ✓ *PSP*
- ✓ *„5S“ Metoda optimizacije procesa*
- ✓ *Regrutacija i selekcija kadrova*
- ✓ *AIP Ananliza individualnih potencijala*
- ✓ *Itd.*

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