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IMPACT OF GROWTH IN AGRICULTURAL SECTOR ON POVERTY LEVEL IN PAKISTAN

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Abstract

The purpose of this study is to analyze the relationship between growth in agricultural sector and poverty in Pakistan. It explores that how much the poor people have gained from growth in agricultural sector of Pakistan by considering growth magnitude and benefits obtained by the poor people resulting from growth for the period of 1985 to 2005 through applying OLS Regression Technique. The results indicate that the variable of growth in agricultural sector is significantly and negatively associated with the variable of poverty, i.e., the growth in agricultural sector of Pakistan will result in reducing the level of poverty in Pakistan.

Key words: growth in agricultural sector, poverty, Pakistan.

INTRODUCTION

The link between poverty and growth has been a mooted issue. At one side, the growth is being regarded a fundamental element for reducing poverty [1], with prerequisites of social services, health and education access. At other side, it is being realized that relationships of inequality, poverty and growth complex and non-linear. [2] found growth and inequality have inverted U shaped association, which describes that in the beginning, inequality will rise with growth, whereas, it will decrease at excessive growth level since growth benefits reaches to the people with low income.

The methods originated by [3] and [4] provided elasticity information for the shorter time periods but did not explain elasticity in long-term time period of inequality, poverty and growth. [5] provided better technique because it did not rely on only assumptions of statistics and but it also provided elasticity information for shorter time period by depending on two or very few surveys. [6] were of the opinion that growth of economy offers same benefits for the poor people as for

the overall economy. [7] also discovers that inequality negatively and significantly impact growth. [8] suggested that elasticity's positive value shows that growth is good for the poor. Therefore, it is being suggested that for achieving swift poverty cutback, the Poverty Equivalent Growth Rate (PEGR) needs to be expanded instead of just achieving normal growth [9].

The rural poor people can be classified according to agricultural land access: the cultivators have land access being smaller tenants and landowners, and being landless and unskilled laborers. The people who do not cultivate may be among the poorest people in rural poor [10]. Moreover, the authors also determined trend analysis for income inequality and rural poverty through axiomatic technique for assessing influence of several variables on Pakistan's household poverty status, for developing PEGR to analyze the influence of agricultural growth on rural poor and for forecasting co-integrated movement of inequality, poverty and agricultural growth.

There are very few studies which explored the association of poverty level and growth rate in

agricultural sector of Pakistan. Therefore, the objective of this study is to investigate the relationship between poverty and agricultural growth in Pakistan for the period of 1985 to 2005 through applying OLS Regression Technique.

Rest of study has been arranged as follows: the materials and methods part of the study has been presented in Section 2, the results and discussions have been described in section 3, whereas, the last section describes the discussions part.

MATERIALS AND METHODS

The data for the period of year 1985 to year 2005 has been collected from [11] and [12]. The OLS regression model has been applied in order to determine relationship of growth in agricultural sector and poverty level in Pakistan. The objective of this study is to explore the relationship of agricultural sector's growth and level of poverty in Pakistan through applying OLS regression model.

The regression model which has been estimated is as follows:

$$\text{Poverty Level} = \beta_0 + \beta_1 \text{GDP} + U_t$$

Where:

Poverty Level = Poverty headcount ratio expressed as percentage

GDP = Real GDP growth rate expressed as percentage

U_t = Representing error term

SPSS 16 software has been used for data analysis.

RESULTS AND DISCUSSIONS

The regression results have been estimated through OLS regression technique and the results have been presented in Tables 1, 2 and 3.

Table 1: Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.908a	.824	.816	5.00346	1.614

a. Predictors: (Constant), GDP growth rate

Table 2: ANOVA^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regress	2351.530	1	2351.530	93.93	.000a
	Resid	500.692	20	25.035		
	Total	2852.222	21			

a. Predictors: (Constant), GDP growth rate

b. Dependent Variable: Poverty level

Table 3: Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	96.3	2.175		44.30	.000
	GDPgrowth	-.39	.040	-.908	-9.692	.000

a. Dependent Variable: Poverty level

The results of Table 1 have shown that the value of adjusted R square is 0.816 which indicate that the independent variable which has been used in this model have explained around 81.8 % of the variations occurring in poverty level of Pakistan. The value of Durbin Watson statistics is 1.614, which indicates that there is no problem of multi-collinearity as the value is within acceptable range of 1.5-2.5. The results of table 2 have shown that P-Value is 0.000, which describes that the overall model is significant to explain level of Poverty in Pakistan and the mathematical form of the model is correct. The results of Table 3 describes that the variable of growth rate is negatively and significantly associated with poverty level in Pakistan. It means that if the value of real GDP growth rate in Pakistan's agricultural sector will increase, it will cause the poverty level to decrease.

CONCLUSIONS

Sustainable and fast growth in agriculture can perform a significant function to achieve poverty reduction. This study recommends that growth in agricultural is indispensable for achieving reduction of poverty. This study has determined the relationship of real growth rate of GDP in agricultural sector and level of poverty in Pakistan for the period of 1985 to 2005 through applying Ordinary Least Squares (OLS) Regression Technique. The

results have shown that the growth of agricultural sector can result to decrease the level of poverty in Pakistan. The government should focus on agricultural sector growth in order to decrease the poverty level in Pakistan.

REFERENCES

- [1]World Bank, 1990, World Development Report: Poverty. New York, Oxford University Press.
- [2] Kuznets, S., 1955, Economic Growth and Income Inequality. *American Economic Review*, 45: 1–28.
- [3]Kanbur, R., 2002, Conceptual Challenges in Poverty and Inequality: One Development Economist's Perceptive. Working Paper 2002–09, Department of Applied Economics and Management, Cornell University.
- [4]Kakwani, N., 1993, On a Class of Poverty Measures. *Econometrica*, 48 (2): 37–46.
- [5]Datt, G., and M., Ravallion, 1992, Growth and Redistribution Component of Changes in Poverty Measures: A decomposition with application to Brazil and India in the 1980s. *Journal of Development Economics*, 38 (2): 75–95.
- [6] Dollar, D., and A. Kraay, 2001, Growth is Good for the Poor. Policy Research Working Paper 2587:50, Washington, DC, World Bank.
- [7] Knowles, Stephen, 2001, Inequality and Economic Growth: The Empirical Relationship Reconsidered in the Light of Comparable Data. Paper for UNU/Wider Development Conference on Growth and Poverty, Helsinki, World Institute for Development Economic Research (WIDER).
- [8]Foster, J., and M., Szekely, 2000, How Good is Growth? *Asian Development Review*, 18 (2): 59–73.
- [9]Kakwani, N., and H.H., Son, 2004, Pro-Poor Growth: Concepts and Measurement. PIDE, 19th Annual Conference, 13–15 January, Islamabad.
- [10] Saboor, Abdul, 2004, Agricultural Growth, Rural Poverty and Income Inequality in Pakistan: A Time Series Analysis. Ph.D. thesis, University of Agriculture, Faisalabad.
- [11]Economic Surveys of Pakistan website (www.finance.gov.pk)
- [12]United Nations Statistical Division Dataset website (www.unstats.un.org/unsd/default.htm)
- [13]Kakwani, N., and H.H., Son, 2008, Poverty Equivalent Growth Rate. *Review of Income and Wealth*, 54 (4): 643-655.
- [14]Amjad, R., and A.R., Kemal, 1997, Macroeconomic Policies and Their Impact on Poverty Alleviation in Pakistan. *The Pakistan Development Review*, 36 (1): 39–68.
- [15]Anwar, Talat, 2005, Long-Term Changes in Income Distribution in Pakistan: Evidence Based on Consistent Series of Estimates. Islamabad: Centre for

Research on Poverty Reduction and Income Distribution, Discussion Paper Series No. 03.

[16]Anwar, Talat, 2006, Changes in Inequality of Consumption and Opportunities in Pakistan during 2001/02 and 2004/05. Islamabad: Centre for Research on Poverty Reduction and Income Distribution (CRPRID).

[17]Kakwani, N., and E., Pernia, 2000, What is Pro-poor Growth? *Asian Development Review*, 16 (1): 1–22.

[18] Ravallion, M., and S., Chen, 2003, Measuring Pro-Poor Growth. *Economic Letters*, 78 (1): 93–99.

THE ROMANIAN EXTERNAL TRADE IN GRAIN

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Abstract

Romania is situated as agricultural potential among the first countries in Europe. But over the time it has been observed that our agriculture has failed to capitalize this potential and in consequence cannot provide the necessities of food for the population of the country. The trade balance is deeply inclined towards imports and even if the situation has improved in recent years, the trade balance in agricultural products remains negative, falling to about \$ 600 million in 2011. This paper analyzes the evolution of trade flows with the grain both in terms of quantity and value.

Key words: dependence, grain, Romania, trade, trends

INTRODUCTION

With more than 14 million hectares of agricultural land, Romania have significant agricultural resources, with a huge production potential, more than half of our country can be put into agricultural use. Nationally, agriculture is one of the most important sectors of the Romanian economy, with forestry and fishery they contribute with about

6% in year 2011 to the Gross Domestic Product [3].

In 2011, the grain production from Romania was 20.5 million tons. It was observed that the domestic production of cereals has increased compared to previous years. Also, our country ranked 5th in the European Union to the production of wheat and 2nd place, after France, to corn [2].

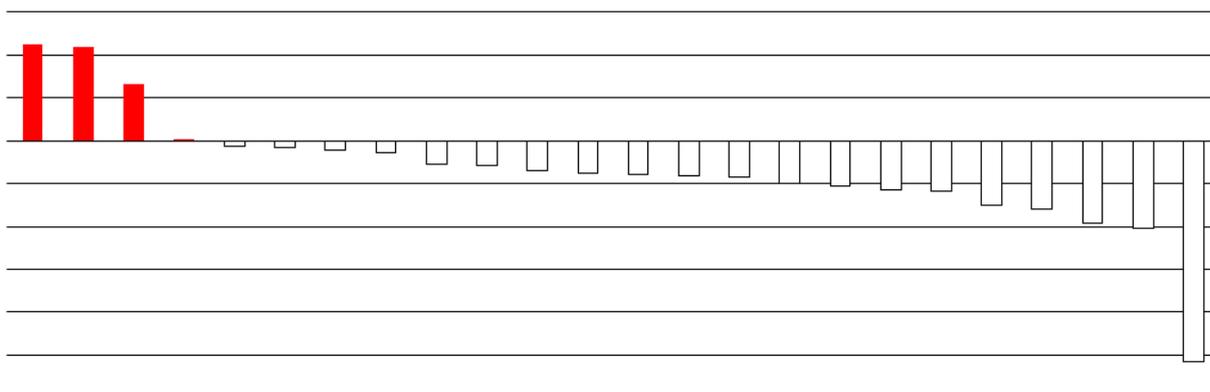


Fig.1.The trade balance for all product group

MATERIALS AND METHODS

To analyze the evolution of the Romanian foreign grain trade for the period 2002-2011, the statistical data regarding both the quantity and value of imports and respectively exports of grain provided by Ministry of Agriculture and Rural Development were used, processed and interpreted [1].

RESULTS AND DISCUSSIONS

Trade balance (Exports - Imports) showed that over the last 10 years (2002-2011) foreign trade was tilted grain exports, except in 2003, 2004 and 2007 while imports of cereals were higher. Exports increased significantly in recent years, as can be seen in Fig.2 and 3.

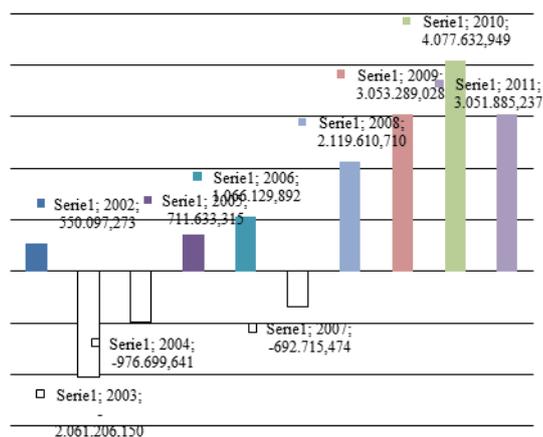


Fig. 2. Grain trade balance 2002-2011 –Tons

The increase of grain trade was possible due to the achievement of yields and total consistently increasing average, which created availabilities for export. It is possible that farm subsidy have increased agricultural production of cereals and oilseeds in particular. As can be seen in Figure 2, quantitative trade balance significantly increased since 2007, when it was negative, by 2010, facing a slight decrease in 2011.

Value, however, it can be seen that the balance has increased from 2008 to 2011. By product category, along the years, most we have exported wheat, corn and barley. According to Figure 5 we find that we are deficient in terms of rice, which is normal for Romania's climate and low water

inclusive, which leads to the conclusion that in 2011 export prices are significantly higher than last year. This conclusion is also confirmed by statistical data.

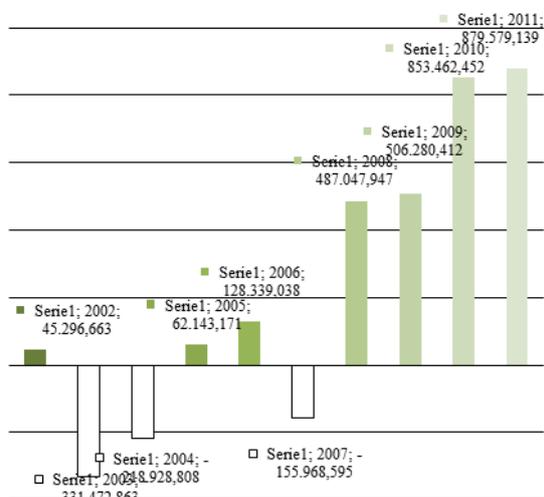


Fig. 3. Grain trade balance 2002-2011 - \$ thousand

In Fig.4, one can notice that in 2002 the balance was positive, \$ 45,296,660, and in 2003 and 2004 underwent negative values, exports are less than imports with \$ 331,472,860, respectively 218 928 810 \$. Also, in 2007 imports exceeded exports by \$ thousand 155,968.60, and in 2008 grew increasingly more, so in 2011 grain trade balance was \$ 879,579,140.

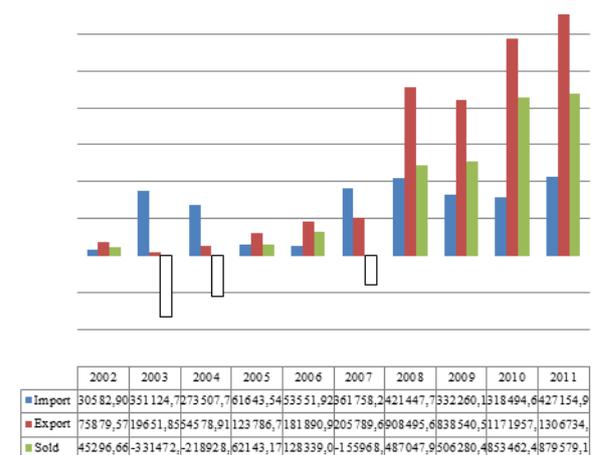
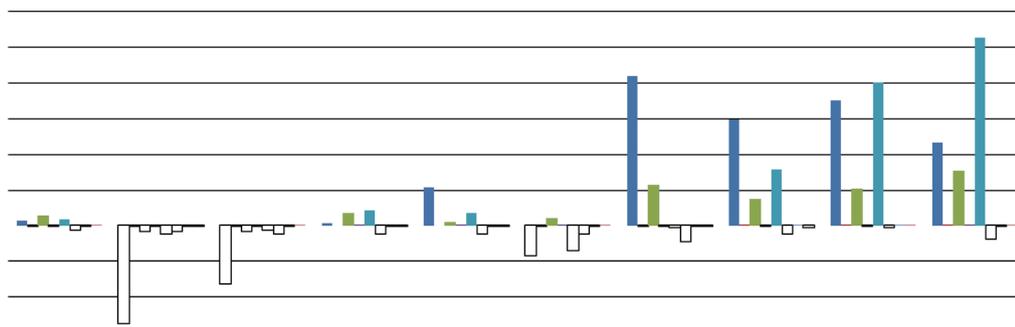


Fig. 4. Grain trade balance 2002-2011 - \$ thousand

availability, but also for sorghum grains, except for the years 2009 and 2010, although grain trade balance is significantly positive except the years 2003, 2004 and 2007, years of severe drought.



	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
■ Wheat and meslin	12,96	-274,94	-162,62	6,70	106,11	-85,23	421,46	299,43	350,76	232,85
■ Rye	-0,01	-0,10	0,00	0,00	0,00	-0,06	-0,02	0,80	0,10	0,25
■ Barley	26,97	-16,76	-16,98	34,29	11,09	23,15	116,37	76,89	103,45	155,70
■ Oats	0,00	0,00	0,00	0,29	0,16	0,02	-0,16	-0,01	-0,03	0,08
■ Corn	16,27	-23,79	-14,43	43,00	35,48	-70,39	-4,24	157,69	401,06	527,59
■ Rice	-10,91	-15,72	-24,78	-22,10	-24,45	-21,65	-43,71	-23,79	-6,15	-38,27
■ Grain sorghum	-0,01	-0,11	-0,13	-0,03	-0,02	-2,19	-1,13	1,23	0,21	-0,25
■ Other cereals	0,03	-0,04	0,01	-0,01	-0,04	0,40	-1,52	-5,96	4,06	1,62

Fig.5. Trade balance by product category 2002-2011 - \$ million

As it can be seen in Fig. 6, the grain trade balance in the period 2002-2011 showed that after the accession, the amount of grain imported from the European Union experienced a significant increase compared to the pre - accession, except 2008, after the severe drought of 2007, when trade balance with the EU is negative.

We calculated the import price by dividing the value of imports to the quantity imported or export price by reporting the value of exports to the quantity exported. In the chart below we can see that the price of cereals, both the import and the export increased from 2002 to 2011, in 2009 suffered a slight decrease over the previous year. It can also be notified that, except for 2007, the import price is higher than the export price, in 2011 the difference between them being about 15%, which leads to the conclusion that either we import seed of superior categories and export cereal consumption or exported grain quality is inferior to the quality of imported grain, this being reflected in the price (Fig.7).

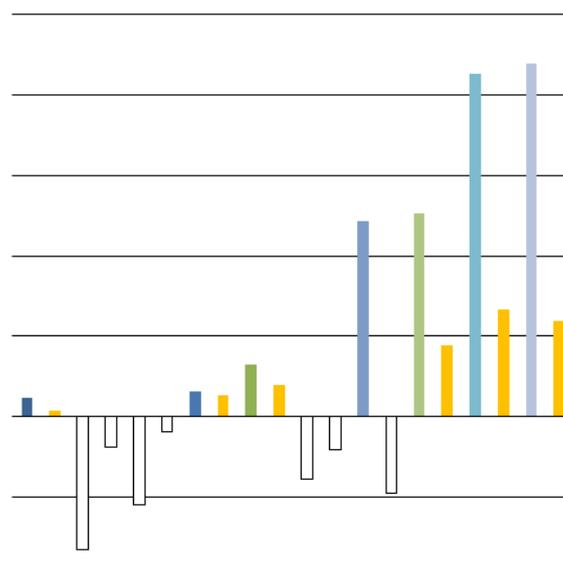


Fig.6. Cereals balance between 2002 and 2011 global and at EU level

Studying Fig. 8, it can be seen that in the total of the groups the value of the cereal import support a significant growth in 2003, ranging from 2.61% to 20.21%, falling to 13.40% in 2004 and 2.45 % in 2005.

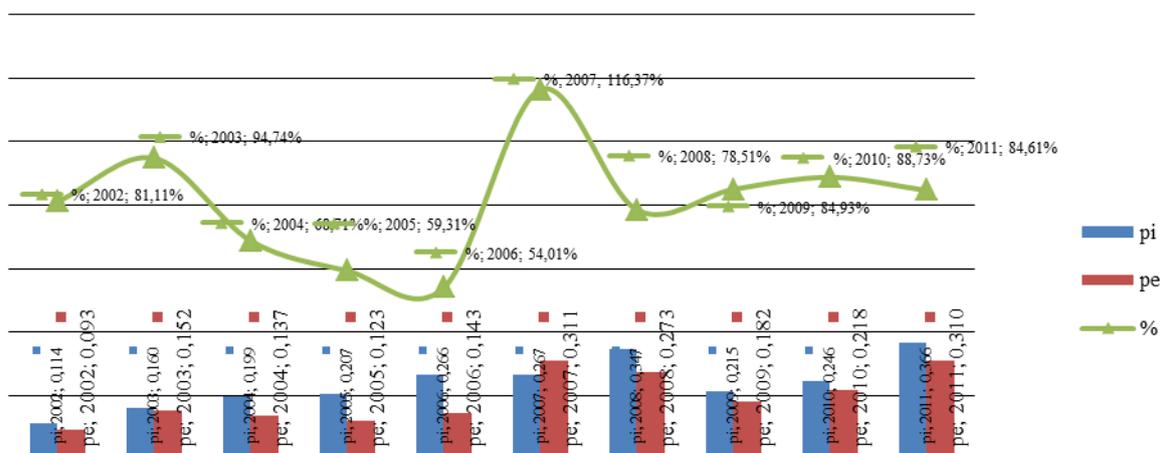


Fig.7. Evolution of import prices, respectively export prices between 2002 and 2011

Between 2008 and 2011 the differences are not very significant, the percentage of grain imports to total imports oscillating by 1-2%. In terms of exports, the situation is reversed. The percentage of the total value of exports, when it comes to cereal category, we see that they suffer a significant drop in 2003 by about

14% compared to 2002 and since 2008, 29% of total export revenues are derived from group cereals. Oscillations between 2008 and 2011 are not very significant, but it can be seen that in 2011 fell to 26.26%.

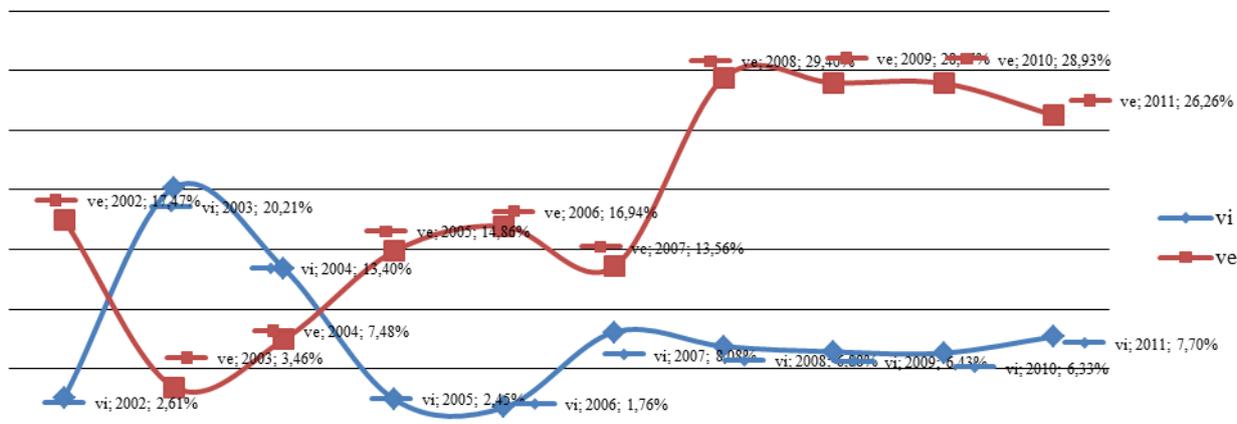


Fig. 8. Evolution of the share of cereals in total groups between 2002 and 2011

The dependence on grain import from 2002 to 2011 is shown in Figure 9. We can notice that after our accession to the European Union it dependence increased significantly. If before we join to the European Union we imported 6.56% in 2002, 46.54% in 2006, we find that after 2008 the percentage is greater than 90%, in 2011 is 84.48%, which means a huge addiction to European Union regarding the

import of cereals. The principle of community preference has redirected the flow of trade. If we talk about dependence on imports towards the European Union in Fig.9, and in Fig. 10 we can see the Romania dependence on exports to the European Union. The least we exported to the European Union in 2002 and 2008. One can notice that our accession did not lead to a significant increase

of the dependence on exports to the European Union countries in 2011, only 45.74% of

exported grains are going to the member states of the European Union.

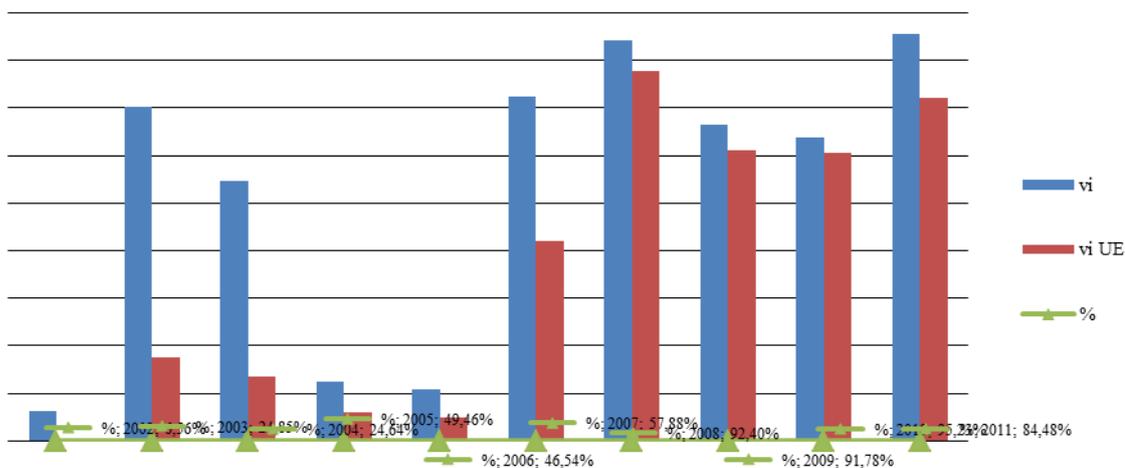


Fig.9. Dependence of imports towards the European Union

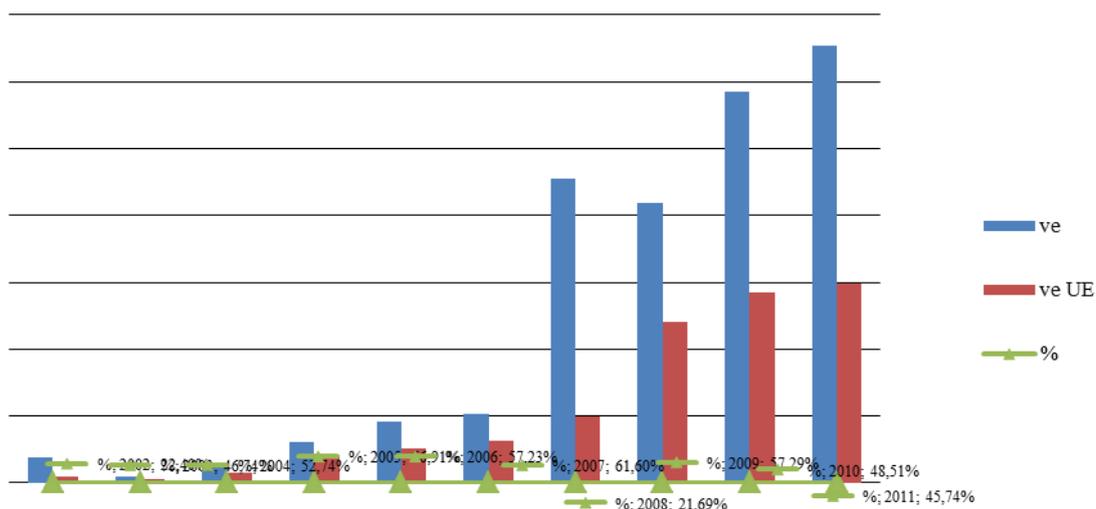


Fig.10. Dependence of exports towards the European Union

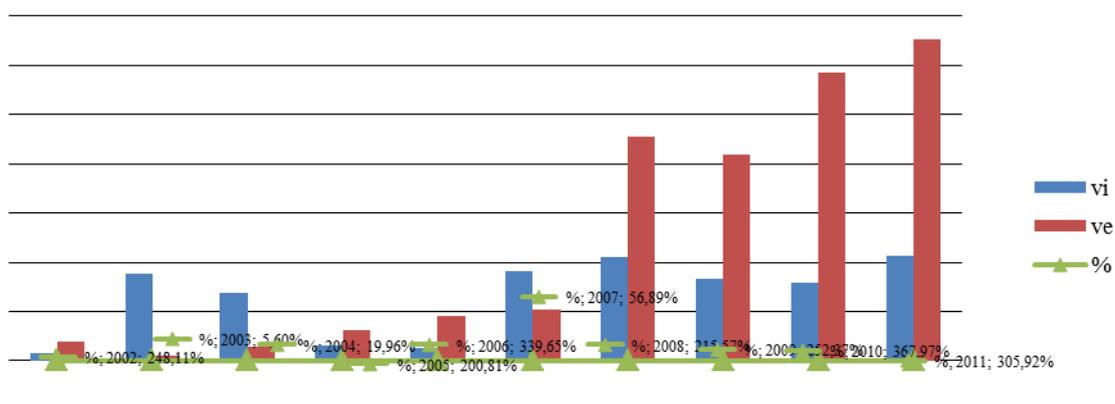


Fig.11. The coverage of imports by exports

Instead in 2003, the coverage degree dropped to 5.60% and in 2004 was 19.96%. And from 2008 we can notice that the value of exports exceeds that of imports by over 115.5%, and in 2010 the coverage was 267.97%.

CONCLUSIONS

Romania is a country that disposes of agricultural power. Cereals always have been one of the important profitable sectors of Romania.

It could be seen that grain trade is one of the few for which Romania has competitive advantages and succeeds exploit them, except for three years - 2003, 2004 and 2007 - and in the recent years exports have increased significantly, although that imports have increased. The main categories are wheat, corn and barley.

Romania became dependent on imports from the European Union, but in terms of exports only half of exported products reach in the European Union.

Also, one can notice that the value of exported grains covers constantly that of the imported products in recent years and we can hope that this trend became one of long term.

REFERENCES

- [1] Ministry of Agriculture and Rural Development, MADR, www.madr.ro
- [2] www.recolta.eu
- [3] www.romtradeinvest.ro

ORGANIC PRODUCTION AND ITS ROLE IN ENVIRONMENTAL PROTECTION

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Abstract

Serbia, as a relatively small country, which does not have a lot number of comparative advantages in the process of globalization can only be, in addition to human resources, rely on their natural resources. Favorable climate, large areas of arable land and forests, healthy environment conducive to the development of organic farming, which may be a response to the process of European integration and the necessity of trade across national borders. Methods of organic agriculture that are already use in many countries in the world, has shown excellent results in the conservation of soil biodiversity, soil and water purification from pesticides and fertilizers. Biological control of pests, the use of natural substances in disease control, fertilizer use, such as manure and compost to increase soil fertility measures that are in accordance with the requirements of a healthy environment, and measures to allow maintenance of the ecological balance in nature. This paper seeks to address the conditions that are important for organic production and considering the natural resources and new agricultural techniques to reduce pollution by analyzing the controlled production conditions and identify measures for sustainable development of high quality food, protection of ecosystems, as well as maintaining and increasing soil fertility.

Key words: environmental protection, natural resources, organic farming, Serbia, sustainable development,

INTRODUCTION

Agricultural production is based on natural resources, manpower and technical means of production. With the increasing population of the Earth, the natural food resources are scarce and a man is trying to influence them. New knowledge and activities of man, created pesticides, fertilizers to increase yields in crop production, machinery for faster and more efficient performance of agricultural practices and irrigation systems for intensive agricultural production.

However, all human activities in addition to the positive impact on increasing agricultural yields have negative consequences from the ecological point of view; such pesticides and fertilizers affect the agro ecosystem, environment and biosphere. Also, mechanized farming affect the soil pressure, which is why less absorbing rainfall, while the remaining water, which flows through the compacted soil carries with it particles of harmful substances and chemicals that pollute the immediate environment. Also irrigated land

affected by a hydrothermal and soil conditions, leading to a significant of relating nutrients to the deeper layers and the increase in harmful biological agents.

Like some kind of reaction to environmental degradation, which becomes more pronounced, the deterioration of food quality and consequently a growing threat to human health, has developed an organic agriculture.

Concepts, alternative, "ecological", or "biological, organic agriculture" means the science and practice of systems and ways of performing plant and animal production that are contrary to your usual traditional agriculture. Under these synonyms are considered farming systems in which the dominant economic principles brought to possible compliance with environmental requirements [1].

Production of organic products is a great chance for Serbian agriculture given the great natural resources and the fact that over 80 percent of the land in Serbia is not contaminated, which an essential prerequisite for the successful development of organic is

farming. When we add to the quality of soil with high humus content, it can be concluded that all the natural conditions for the development and justification of dealing with organic production.

Also, the potential is the presence of large areas of meadows and pastures that are not used in rural areas as a result of decades of continuous decline in the number of livestock in the country. These regions are often avoided because of the underdevelopment of the chemicals and pollution that accompanies development, and the natural communities and habitats preserved. Very strong resistance of indigenous breeds to their growing without major investments in health care and treatment, and in this way obtain special quality animal products for human consumption, which does not contain residues of various antibiotics and pesticides [2].

In recent years significantly increased interest in organic agriculture, in response the increasing environmental degradation, deterioration in the quality of food and the growing threat to public health of the human population.

Organic farming as a system takes into account environmental, economic and social aspects of agriculture at the local, national and global level. Therefore, the goal of organic agriculture is producing sufficient quantities of high - quality food to the rational use of natural resources and the environment.

One of the important aspects of organic farming is the socio-economic aspect. In fact, this kind of production requires a small investment in terms of products, materials and equipment, and thus the production can be included a large number of small producers. On the other hand, organic products are sold at higher prices that allow a fair income for producers and compensate for reduced yields and increased levels of the organic production method. The inclusion of small producers in organic production positively affecting the security of their existence at the place where they are located, and that affecting to on regional development and to on economy of the country[3].

Steady growth in demand for organic products in the world suggests that this production method can be very profitable if properly used natural resources, knowledge and production experience.

MATERIALS AND METHODS

This paper presents the results of a statistical analysis of the percentage of the structure of agricultural land by type of crop production and the structure of organic livestock production in Serbia, and the number of farms and the ratio of the areas of arable land under organic crops in comparison with conventional areas in the world. These data can serve as a solid basis for predicting the performance of certain features and prospects of development of organic production in Serbia, due to the preservation of nature and environmental aspects that exist. Also, comparative analysis of the data shows the development of organic farming in the world and Serbia.

For this purpose, the published material is used and the Federal Republic Bureau of Statistics and the Ministry of Education, Science and Technological Development, World Bank data, the Food and Agriculture Organization (FAO), as well as numerous consulted the literature.

RESULTS AND DISCUSSIONS

Organic Farming

Scientific basis of organic farming are set 80s, based on research conducted in Europe, Japan and the United States. The primary research categories were : [4]

- crop production
- livestock production
- horticultural production
- reducing the risk of health and safety
- economics and sociology
- assessment and the use of basic resources and
- management of pasture and woods.

The basis of all primary category represents crop production because of plant production is used to feed livestock and livestock provide

organic fertilizer for plant nutrition. The investigations so scientifically developed following najznačalnija issues crop production and organic farming. For our production requirements of special importance:

- crop rotation
- exchange of energy from conventional to organic farming method
- green manure
- cover crops
- intercropping
- use manure
- composting
- organic matter in the soil and its maintenance and its role in crop production ;
- biological nitrogen fixation ;
- land microbiological studies on pest control;
- new crops specifically for small farms ;
- genetics and Selection of low pH and limited land fertility;
- machinery and equipment for organic cropping and small farms and
- economic and sociological evolution of the system of organic farming.

The above questions are not only important for biological farming system (organic cropping), but can be, in general, relevant to all areas of plant production.

In modern processing plant production area has a special place. In conventional processing system, applicable to heavy machinery and tools, which a large number of walk consume large amounts of energy, and in addition have a negative impact on the physical and other properties of soils. Here, then, are the reasons why it is necessary to review and some changes in the processing of land for major agricultural crops. It is believed that the conventional treatment reduced gradually in order to find a rational technology. Future solutions in streamlining the traditional treatment system will go towards reducing energy consumption and a smaller proportion to the investment. The concept of sustainable agriculture, tillage will have conservation character (above 30 % of crop residues remains on the soil surface), which will play an important role in

preserving fertility and prevent degradation of land as a natural resource[5].

It should be noted that the success in finding environmentally friendly solutions in the technology of crop production largely depend on environmentally educated people in agriculture and their involvement in the transfer of environmental knowledge and technology in agricultural practices. This is especially important if we consider our great advantage because still preserved and less polluted soil compared to developed Europe. Therefore, it is our opportunity far greater production of high-value and safe food and its export to foreign markets.

Organic farming in the world and in Serbia

Organic production in the world is becoming more prevalent and economically significant, and about the importance of this type of production is the fact that today is conducted in 140 countries, at 32.2 million acres, on 633 891 farms, totaling 0.7 percent of the agricultural land on the planet and that its value exceeds \$ 25 billion. World sales of organic production is increasing annually by 15%. The most important organic food markets are the U.S., Canada, Europe and Japan. In Europe, the largest consumers of organic food are: Germany, Great Britain, Italy and France. World sales of organic production is increasing annually by 15%. The most important organic food markets are the U.S., Canada, Europe and Japan. In Europe, the largest consumers of organic food are: Germany, Great Britain, Italy and France. According to the 2011th The countries with the largest organic areas are Australia , which has 11.8 million ha, Argentina with 3.1 million hectares , 2.3 million hectares of China and the United States with 1.6 million acres[6]. However, the number of farms and the ratio of area of arable land under organic crops in comparison with a conventional, is the largest in Europe. The percentage ratio of the areas of organic production in the surface states, gives a completely different picture with regard to the fact that the top 10 countries represented only European countries and Liechtenstein (26.4%), Austria (12.9%) and Switzerland (10.27 %). The largest area

of organic production system in Europe, in Italy, Germany and the UK, and these countries are the most important sector of organic production. About 6 % of arable land in organic production system in most European countries. More pronounced tendency of development of organic agriculture in the countries of Central and Eastern Europe such as the Czech Republic, Slovakia and Poland.

Some countries regard the primacy of certain products. For example, the largest producer of organic citrus fruits is Italy, Mexico is largest producer of organic coffee and the largest producer of cocoa is Dominican Republic. Italy, Spain and France are the leaders in the production of organic grapes, while the largest producers of organic olive are Spain and Tunisia. Climate, historical heritage and the state support the organic sector to create the conditions of a country are the leaders of a specific organic production. [7].

In the period since 2007. - 2011th, the trade of organic products has grown from 23 to 40 billion dollars. And if there is an increased selling prices of organic products are still high at an average of 15% to 30 % compared to the products obtained by conventional production methods. Demand for organic food in the period since 2001. - 2011th in the U.S. has increased by 15-20 %.

Germany is one of the countries with a long tradition and high reputation in organic production, and is one of the leading producers of organic food, as well as one of the largest markets in the world with an annual turnover of around 3.9 billion euros. Consequently, the company offers over 1,800 organic products designated 35,000, Bio, organic certification, which is the official state symbol in Germany since 2001.

The country with the highest share of organic products in the market, compared to other products, Switzerland is 4.5%, which in addition has the highest consumption of organic products per capita (100 Euro per individual) [7].

The EU Member States, despite significant local production and further demonstrate the

need for imports of organic products. Serbia can take advantage of the chance and invest significant amounts of organic products in the international market. Area under organic production in Serbia in the 2012th increased by nearly 30 % compared to the 2011., and an increase in organic livestock production complete. Taking into account all these unused natural opportunities that Serbia has, at the same time and the huge increase in demand for these products in most of the world markets, which can not meet their needs from their own production, there is a possibility that the trend of increasing size to continue in the coming years.

Organic agricultural production in our country is still in the development stage. Due to the potential offered by the natural resources of our country, the establishment of this type of production is a step forward not only in terms of rural development, environmental protection and improvement of human health, but also from the standpoint of economic prosperity [8].

In July 2009th was done in the draft National Action Plan for the development of organic agriculture which defines the activities for the development of organic agriculture in the Republic of Serbia for the period since 2010. - 2015. [9]. The law's aims of: obtaining products with documented procedures production, sustainable socio-economic rural development, consumer protection, placing the label that clearly indicates the ways and methods for production of organic products, the protection of natural resources from pollution, long-term maintain and increase soil fertility, biodiversity conservation.

The new law introduces some innovations, especially when it comes to certification. He confides separate certification organizations, and the Ministry of Agriculture authorizes to do the job, keep a register of organic production, certification bodies inspect and proposes measures for the development of organic agriculture. With us, in accordance with the Law on Organic Production, a certified organic product is marked "organic product" code by the authorized organizations

and national character. Appearance on national character provides the Minister.

In Serbia, currently organic production is an area of about 829,000 ha, whether it be on products that have been certified or who are in the process of obtaining certification for organic production, arable land used for organic production occupies an area of 11,000 ha. There are around 150 certified producers and about 160 in the conversion process. Currently in Serbia, this type of farming deals with about 3,000 farms, which indicates that the job of a population of 9,000 people. The 2011th, The total area under organic production amounted to 6294.61 ha.

According to the above Table 1 the structure of land by type of crop production in the 2012th year is the most common fruit production with 46.36 %, followed by crop production with 41.31 %. Meadows and pastures occupy 7.57 % until vegetables are grown on 4.77 % of organic surfaces[10].

Perennial species are grown to about 46.7 %, and one- on about 46 % of the total area under organic production, the remaining 7.3% are meadows and pašnjaci. Od perennial species dominate apples, plums, and berries, particularly raspberries. Of the annual species are the main cereals, soybeans and vegetables. Despite the fact that the berries are the main export species, manufacturers are opting for other species such as apples and plums. Apple surface with organic status amounted to 1177.55 hectares, while the conversion is 6.02 ha, which means that a total of 1183.57 ha. Surfaces with organic status of plum amounts 1188.56 ha area in conversion amount 39.48 ha for a total of 1228.04 ha. Also, there is a significant increase in the areas under the one species.

The main objective of organic farms is the sustainability. It is important that a balanced relationship between crop and livestock production provide enough food to feed domestic animals or livestock to provide manure.

Table. 1 Structure of the categories of crop production in 2012.

	Organic vegetable production in 2012th			
	Areas in conversion (ha)	Areas with organic status (ha)	Tota, (ha)	% of total arable area
Crop production	1734,39	2.850,43	4584.82	41,31
Fruit production	1091,19	4054	5145.19	46.36
Vegetable production	233	296,5	529.5	4.77
Pastures and meadows	818,97	20,83	839.8	7.57
Total	3877,55	7222,26	11099.31	100

Source: Organic Farming in Serbia 2013th National Association for organic production, Serbia Organica,

In average, 1 ha of crop production should be suspended 1-2 heads of cattle (depending on the type and intensity of production).

Organic methods of animal husbandry conditions and provide a way of keeping animals, the type and quality of facilities, free movement of animals and the cultivation of the optimum density. Animals are fed organic food and provides the list of allowed nutrients. The Animal Health greatest attention is paid to prevention, which includes all measures of hygiene[2].

On average about 90 % of feed domestic animals are not used for their operations and products, but they returned in the form of liquid and solid excreta - organic fertilizers, without which no sustainable land. In organic farming, farm animals must be provided with suitable conditions for breeding, including their welfare and their health in accordance with the type and rasom[9].

According to test results, the Research Institute of Organic Agriculture, from Switzerland, in Germany, in the most organic livestock are bred sheep (8%), beef cattle breeds (3.2%) , and dairy cattle breeds (2.3) while only 1 % of poultry and pigs grown in an organic system. From organic animal products the highest consumption of organic milk, which is more widespread in supermarkets in most countries of the

European Union. For now, the biggest production of organic milk in Denmark and is 15% [11].

In Serbia, according to Table 2 The structure of organic livestock production is as follows: organic status occupies most flocks which include sheep, goats and pigs (983 animals), while the number of sheep in conversion is still 3404 heads. Followed by poultry (chickens, geese, ducks, turkeys, guinea fowls), bee hives and the least number of animals in the herd which include cattle, buffaloes, horses and donkeys, which has in the conversion in 2164 and 230 head of cattle in the organic status.

Table. 2 The structure of organic livestock production (2012).

	Organic livestock production 2012th the conversion period	
	Conversion period- Number of livestock, poultry birds, beehives hives	Organic status Number of livestock poultry birds, beehives hives
Herds (cattle, buffaloes, horses, donkeys)	2164	230
Flocks (sheep, goats, pigs)	3404	983
Poultry (chickens, geese, ducks, turkeys, guinea fowls)	4276	3600
Beehives	2610	4394

Source: Organic Farming in Serbia 2013th National Association for organic production, Serbia Organica, Belgrade

In Serbia, according to the test more than 4,000 farmers involved in organic production. The total value of organic production in

Serbia can not be precisely determined due to the lack of clear empirical data.

The interest in organic farming, which is also reflected in the market for organic products in the last ten years has increased three times.

Despite the current difficulties, organic farming is moving towards alignment with the needs of market development and conservation of the environment and to reduce the quantity at the expense of food, while favoring agricultural techniques that optimal use of natural resources (recycled biomass and energy) and minimize waste matter [1].

CONCLUSIONS

The main advantage of organic farming is the production of high-value and safe food, which will be a source of human and animal health. It is well known that many diseases of modern mankind descended from malnutrition and the use of contaminated and unsafe food. Another great advantage is the preservation and protection of the environment, which we have provided clean soil, water and air for our children.

When it comes to agriculture disadvantages of this type of food production are insufficiently developed technology (lack of machinery, plant protection, seed and other materials) and hence less productivity of these systems is of growing plants. It takes a lot of effort and research to promote organic farming and all the complex mechanisms found in nature in order to achieve a balance between human needs for food and other materials from nature.

Organic farming is currently one of the most promising sectors in the world economy. The increase of organic production would bring Serbia: optimal use of agricultural resources, a higher rate of economic growth, increase exports, increase local agricultural production, improving the standard of living in rural areas, rural development and the preservation and increase of the rural population.

ACKNOWLEDGEMENTS

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REFERENCES

- [1] Slavica Arsić, Nataša Cecić, Predrag Vuković, 2007, Organic farming in order to protect the environment, Proceedings of the XII conference on biotechnology, Vol. 12 (13), 2007, pp. 9-17, Cacak 2 to 3 March 2007, ISBN 978-86-82107-87-3 UDK 63 (82) 60 (82) COBISS.SR. ID 138 143 756 Organizers: University of Kragujevac, Faculty of Agronomy in Cacak
- [2] Arsić Slavica, Kljajić Nataša, Ivić Milenko, 2012, Livestock and the development of organic livestock production in hilly and mountainous areas on the basis of available resources in Serbia, Warsaw 2012. Poland, European Rural Development Network, Institute of Agriculture And Food Economics - NRI, Institute of Agricultural Economics Belgrade, Rural development policies from the EU enlargement perspective, Vol. 9. Rural areas and development, pp 121-138. Editors: Zbigniew Floriasczyk, Drago Cvijanović ISBN 978-83-7658-275-7
- [3] Slavica Arsić, Predrag Vuković, Nataša Kljajić, 2011., Opportunities and perspective for development of organic production in rural areas of Serbia, International conference: Rural development policies from the EU enlargement perspective“. Thematic Proceeding. (International Conference: "Rural Development Policy from the perspective of EU enlargement". Theme Collection.) Ecka. 8-9. September. pp. 13-21. Publisher: Institute of Agricultural Economics, Belgrade.
- [4] Sredojević Z., 2002, Economic Problems of Organic Agriculture, Belgrade
- [5] Predrag Vuković, Slavica Arsic, Lana Ivanović, 2007, Organic farming and environment, Scientific papers faculty of agriculture XXXIX, Part II-a, University of agricultural sciences and veterinarian medicine of the Banat Timișoara, Editura AGROPRINT, Timișoara 2007., pp. 17 – 23. ISSN 1221-5279
- [6] www.organic-world.net accessed 25.02.2013.
- [7] www.fao.org.
- [8] Nataša Kljajić, P. Vuković, Slavica Arsić, 2008, Organic farming and the role of marketing, Professional work, UDC 631.147:658.8 p. 421-429

- October-December, 2008, Vol. / Vol. LV, No. .. / N ° 4 (339-432), Agricultural Economics, 55, Belgrade
- [9] National action plan for the development of organic production in Serbia (working document) 2009th Ministry of Agriculture, Forestry and Water Management of the Republic of Serbia, Belgrade.
- [10] Organic agriculture in Serbia 2013, National Association for organic production, Serbia Organica, Belgrade.
- [11] www.fibl.org

A HISTORICAL ANALYSIS OF THE COMMON AGRICULTURAL POLICY

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Abstract

Agriculture is perceived by the EU as occupying a special place in its economic and social structure, because of its content and its relevance at the level of each individual. Consequently, the EU sustains that the relative poverty of a high proportion of its agricultural and rural population needs a protectionist price policy combined with a long term policy that would aim at its rural development, especially in the peripheral and poorly developed areas. Between EU policies Common Agricultural Policy is regarded as one of the most important. This not only because of the budget for the Union to finance this policy (which is about 50% of the total budget) the number of people affected and territory involved, but also the historical importance of delegated sovereign attributes EU Member States to the decision. The importance of the Common Agricultural Policy derives of close links with the single market and economic and monetary union, two key areas of European integration.

Key words: agriculture , Common Agricultural Policy, European institution

INTRODUCTION

The governments of the member states, together with the governments of the other developed world states, have admitted the fact that agriculture is affected by the special economic and social problems which normally don't affect the other sectors, especially due to the cyclic nature of the agricultural production.

Therefore, in the absence of an official support, the prices of the agricultural products tend to decrease, while the prices of the raw materials and other industrial products, which farmers must purchase, tend to increase. Hence, the life level of farmers had to be maintained at the same standard as that of their partners in the urban regions. The path used to equalize the life levels was that of sustaining the increase of productivity in agriculture.

The Common Agricultural Policy (CAP) is among the common policies adopted by the Union Europe, then European Economic Community (Treaty of Rome 1957). Its Genesis was a reaction to food problems that followed the Second World War. It should be noted that the term "common policy" reflects

one of the defining features CAP, that for about 90% of agricultural products, the decision no longer rests with the Member States, but the European Union [3].

MATERIALS AND METHODS

The existence of internal surpluses and the increase of the exported quantities, resulted from the increase of productivity, had led to very high budgetary expenses that had to be made in order to sustain the prices. At the same time, sustaining the income in the rural area had been officially encouraged by means of the added value through specialized farms, to the final agricultural products, as well as to non-agricultural activities (rural tourism) [10]. Initially, the approximation of the alimentary products' prices was considered as having an important contribution to the harmonized industrial salary costs, forming therefore a basis for enlarging the common market of industrial goods. Although, as time went by, the alimentary expenses started to represent an increasingly lower percent of the total expenses made by individuals, and this way of thinking is still valid.

CAP preparing Conference in Messina, in 1955, decided, after long debates, that agriculture should be included in the “common market” system. Once this decision made, the partners had to decide whether they wanted to apply, in the case of agriculture, only the general rules of free exchange and competition, already established for the industry, or if they had to establish separate rules for the agricultural sector.

The current model of economic and social development needs a combination of institutional strategies which are specific to the domain with innovative entrepreneurship models adapted to the societal context. Therefore, at the level of the common agricultural policy, besides the specific tools, the governance model focuses on the small scale exploitation in which the principles of the agricultural entrepreneurship are centered on the individual and his needs, engaging the community, on the one hand, and the individual, through the consume, on the other hand. According to the new directions of the CAP, the focus is on the sustainability paradigm, containing alimentation, environmental protection, protection of natural resources, the fight against climatic changes. Therefore, we can identify four fundamental changes at the CAP level:

- (1) promoting the production on a small and medium scale in harmony with ecosystems, combining innovation with traditional knowledge, in order to obtain alimentary products in a sustainable manner;
- (2) promoting local products, as a unique method of combining the favorable effects of acclimatization, protecting the biodiversity and promoting local alimentary products and the community's traditions, with positive economic effects;
- (3) promoting local agro-alimentary systems in order to create knowledge and solidarity exchange networks between agriculturalists and city dwellers, gambling on the increase of the agricultural culture inside the urban population, especially through education and the acknowledgment of the benefits of agro-alimentary products consume;

- (4) promoting some ecologic agro-alimentary systems not only for reducing the dimensions of the agro-alimentary enterprises, but also for rewarding, in parallel, those who actually implement the agro-ecologic techniques, offering contributions to the community in the form of ecological services [2].

RESULTS AND DISCUSSIONS

The result of these discussions was the development of separate special rules for agriculture, mainly because of the importance given to the agricultural incomes' support by the countries having a developed agriculture. As a result, in the final text of the Treaty of Rome, signed on March 5, 1957, the states agreed upon the establishment of a combination between these special rules and the general application in agriculture of common market's principles. In the Treaty, it is specified the fact that agriculture is submitted to commercial and competitive rules applied in the European Community. But these general commercial rules are abandoned or modified in many cases, by applying the 38-47 articles of the Treaty. These articles had been mainly established and developed as was of escape, which allows the establishment of monetary restrictions, market organizations, as well as controls over the goods' movement which, from an economic point of view, are contrary to the principles of free exchange that govern the rest of the Treaty. This freedom of intervening in the agricultural commerce is stipulated in the 38th article of the Treaty of Rome, which states that common market will extend over the agriculture (the rules set for establishing the common market are applicable to agricultural products), “with the exception of the contrary directives of the 39-46 articles” (Treaty of Rome, art. 38, paragraph 2) [9].

When the six members of the European Economic Community were trying to establish a common market, they were using various customs taxes, variable taxes, subventions for production and market intervening methods, so that they could protect their markets from “the negative

effects of importations” and sustain the prices of their farmers. Therefore, it had been acknowledged the difficulty degree which is inherent for reaching the objectives established in article 39. This is why article 40 established the means that were going to be used in order to reach the harmonization of the agricultural policies. Although mainly contradictory, this article sets the principles of applying the common rules regarding the competition in the trade with agricultural products between member states and the creation of a uniform system of organizing the market at the level of the Community.

The Common Agricultural Policy is the oldest and the most integrated of the common policies adopted by the European Economic Community inside the Treaty of Rome in 1957, being actually launched in 1961. Its genesis was a reaction to the alimentary problems that had followed the Second World War, respectively the dramatic decrease of the agricultural production especially in France and Germany, followed by the increase of importations from America with negative consequences on the commercial balance.

The Common Agricultural Policy has substantially contributed to the process of economic integration, by means of fluidizing the European commerce with agricultural products, due both to the elimination of customs taxes as well as practicing the external common customs tax, which contributed to the development of production and exportations, as well as to increasing the work productivity in agriculture, the farmers’ incomes, a result of the mechanization in the 1950’s and the implementation of technical progress [8].

However, in the context of an increasing importance of the industrial sector and the existence of an inelastic demand in what regards the price of agricultural products, the incomes that could be obtained from agriculture are inferior to those from industry [4]. In these circumstances, in order to avoid the reopening of some older social conflicts, governments started to adopt measures for custom protection and for supporting the production, which vary in what regards their

form and intensity from one country to another.

As a result of practicing a protectionist policy, the agricultural production grew with no connection to the demand, and this thing generated surpluses especially in France for the wheat production, which had to be exported. The solution was to sign up some bilateral agreements in order to ensure the outlets. Another problem was that of the existence of an work-offer residue in agriculture, a consequence of the mechanization in this field of economy, residue that could not be absorbed by the other branches, having as consequence a decrease of the net incomes in agriculture.

All these problems culminated with the idea of a European regulation of the market for agricultural products (initiated in Holland) that would guarantee the stability and continuity of exportations, as well as the protection of farmers’ incomes.

Therefore, the CAP’s objectives established through the Treaty of Rome looked at the following aspects:

- Increasing the offer of agricultural products;
- Increasing the productivity by means of promoting the technical progress and the optimal use of the production factors, especially the workforce;
- The stabilization of the market: purchasing production residues at guaranteed prices and creating stocks;
- Reasonable prices for consumers;
- Increasing the farmers’ incomes [5].

Acquiring these objectives will be made through the common organization of agricultural markets according to the product (the common placement of a product or group of products in a private regime), which requires: the organization of a European market, the coordination of various national markets, as well as the establishment of the rules regarding competition [1].

The negotiation on the reformation of the Common Agricultural Policy will mainly take into account the financial resource given by the CAP. However, the reformation has the ambition of going even further: the revision of direct help schemes, the balancing of

subventions and aids for rural development, the inclusion of ecologic themes or the amelioration of the European agriculture's competitiveness. In this context, it is necessary to evaluate the positions of the various actors involved in this process, with the purpose of providing a bigger image of the force equilibrium at a European level.

As the CAP has developed and become more sophisticated, in line with the requirements EU citizens, the following factors have gained greater importance: care for the welfare of society rural improving food quality in Europe, ensuring food safety, ensuring protecting the environment for future generations to ensure better conditions for health and animal protection, achieving all of the above at minimal cost to the EU budget (which is funded largely by taxpayers, ie ordinary citizens) [7].

The conservative side. This category includes France, first of all, the country that benefited and still benefits from CAP, as well as countries such as Greece or the vast majority of the new member states from Eastern Europe, including Romania. This group of states, as the French President Sarkozy was saying, sustains "a new Common Agricultural Policy funded on prices and communitarian preference", which means the preserving of the status-quo. The states platoon lead by France sustains the preservation at the same standards of the communitarian agricultural budget (approximately 40% of the total European budget) and defends, at the same time, the First Pile of subventions for production in the detriment of a prioritization of a rural development via the Second Pile. The new elements that this heterogeneous group of states sustains include measures that are in trend, like: protecting biodiversity, ameliorating the ecologic conditionality in order to obtain European financing, and a better connectivity of agriculture on the market. Inside this group we find a special group formed of the new member states that, by protecting investments, actively militate for the simplification and the harmonization of their allotment [6].

This conservatory position of various member states is very actively sustained by the powerful agricultural lobby from the European level, which brings forward numbers that show a well-financed European agriculture. According to these, the European agriculture that produces 30 million workplaces in the entire EU must remain strong and well financed in order to produce aliments and create public goods such as protecting the environment and biodiversity, ameliorating and protecting the natural environment – including by means of creating specific conditions of fighting against flooding or desertification [5].

The reformist side. On the other side of the spectrum of interests we find a group of actors led by Great Britain, a traditional critic of CAP, sustained by countries such as Denmark, Sweden or Holland. According to these, the Common Agricultural Policy must be profoundly reformatted so that it would take into consideration the new economic conditions in Europe, conditions that imply a reevaluation of the EU's priorities. Therefore, Europe's main priority in the new context is the amelioration of the economic competitiveness, including the agricultural area. This thing would be translated by the substantial decrease of agricultural subsidies in favor of a more flexible financing system, based on contractual principles, in which eco-conditionality would be ameliorated and which would focus on agriculture's multi-functionality. This group of countries sustains not only the decrease of subventions but also an obligatory modulation that would transfer more and more funds from the First Pile towards rural development and (co)financing precise and easily assessable projects. Finally, according to these, a strong rural development Second Pile, based on the eco-conditionality principle and oriented towards the market would contribute even better to the amelioration of the fight against climatic changes

Therefore, while Great Britain already strongly sustained a significant decrease of the budget allotted to the CAP, its usual allies didn't followed the same path, but supported,

at least for the moment, the traditionalist side, sustaining the preservation of the CAP's budget to the current standards.

The moderate side. In the context of the dilemmas between the conservatory and the reformist sides, there are at least two actors that have a rather moderate position. The first of them is, somehow naturally, the European Commission, which must aggregate the various interests in a balanced legislative proposal in order to facilitate a future consensus of the legislators (The European Parliament has a co-decisional power in the agricultural domain after the activation of the Treaty of Lisbon). In this sense, Dacian Cioloș, the Commissary for Agriculture, proved that he has a middle position, despite the fears regarding his partnership with the conservatory side. Although he strongly sustained the preservation of the current CAP's budget, he showed to be really open to the principles of a multi-functional and flexible agriculture: "I cannot imagine the rural area without agriculture, but I cannot see it only with agriculture" [11]. Moreover, the new commissary showed that he wants a simplification and a bigger clarity of allotting subventions via the First Pile, being preoccupied at the same time with ecologic themes and a better integration of these in the new Common Agricultural Policy.

On the other side, at least until now, the European Parliament seems to have been placed on the same moderation line when it comes to the CAP reformation. In a recently adopted resolution, the European deputies sustain the preservation at the same level of financing "at least in the following period of financial programming" (2013-2020). It was expected that ecologic themes such as the protection of biodiversity or eco-conditionality should be present in the Parliament's position (this usually being the EP's appanage), but what is unusual is the underrated support given by the deputies to rural development. The rather fade position of the euro-parliamentarians can be explained through the unexpectedly wide consensus over this resolution which probably diluted the strong positions of the political groups.

However, it is expected that after the activation of the Commission's legislative proposal, the positions of the political groups to be more trenchant.

Finally, in what regards the public opinion, it seems to be rather inclined towards a traditionalist vision of the CAP, being normally satisfied with its current state. Therefore, 90% of the citizens interviewed as part of a Euro-barometer survey, consider that agriculture and the rural areas are vital for Europe. In the same sense, 83% of the interviewed ones sustain the preservation of the current level of subventions simultaneously with keeping at the same standards or even increasing the CAP's budget (only 17% consider that the agricultural budget is too high). In what regards the ecologic themes, most of the Europeans (82%) sustain the integration of the preoccupations for environmental protection in the CAP's mechanisms, prioritizing at the same time the process of ensuring safe and quality products (Romanians do not share this opinion, as they consider as main priority the ensuring of a stable life standard for the farmers – 60% of the respondents).

Therefore, from the force equilibrium at the European level we can notice, at least for the moment, an advantage of the conservatory side in what regards the negotiations regarding the future of the Common Agricultural Policy after 2013.

CONCLUSIONS

The initial goal of the Common Agricultural Policy was that of ensuring the auto-sufficiency and stability of agro-alimentary products' markets; afterwards, after the elimination of the definitive danger of the alimentary penury and after offering the farmers and the processors in the CAP funding states a proper life standard, the achievements in the agro-alimentary sector have become more than sufficient (a 20% bigger production of cereals as compared to its needs and the agricultural production would increase with a 2% average while the demand was staying the same or even

decreasing; moreover, there were disproportionalities in the farmers' incomes, so that 20% of them were receiving over 80% of the total budget for agriculture), and this thing requested the elaboration of a mechanism that would be able to absorb the surpluses without diminishing the farmers' incomes.

Currently, the CAP's challenges are not related only to the establishment of some prices and incomes that would be sufficient for farmers, but they are also highly related to the fight against the penury of natural resources, their rational use in the context of the proliferation of the negative effects of the economic-financial crisis, with direct repercussions over the consume of agro-alimentary products and the functionality of the agricultural products' market.

Moreover, another challenge is the durable development and the ensuring of its premises, with impact on the medium and long term agriculture's sustainability. In this context, it is highly important for agriculture the intensive growth of the ecologic agriculture rate, the development of the bio products' market and the development of eco-efficient behavioral abilities in the case of the consumer of agricultural products.

REFERENCES

- [1]Balaceanu Cristina, 2012, Fundamental mechanism of the single European market, ProUniversitaria Publishing, Bucharest, ISBN 978-606-647-460-3
- [2]Cofas Elena, 2013, Objectives And Requirements Relating To The Sustainability Of Romanian Agricultural Production, International Scientific Symposium "Managing Sustainable Rural Development", Department of Management, Timisoara, Scientific Papers, Series I, Vol XV (1)
- [3]European Commission, Directorate-General for Agriculture, Common Agricultural Policy Explained, 2004.
- [4]European Commission: Towards Sustainable Farming, IP/02/1026, Brussels, 2002
- [5]Fântâneru Gina, Cofas Elena, Distribution Aspects of the direct payments between eu member states, Scientific Papers series "Management, Economic Engineering in Agriculture and Rural Development, vol.12, issue 4/2012, print ISSN 2284-7995, pp. 78-81
- [6]Nedeia Petronela-Sonia, 2012, The Evolving Concept of Sustainable Agriculture, Tibiscus Annals,

Economic Sciences Series, Volume XVIII, Supplement, publisher Mirton, Timisoara, pp. 64-69, ISSN 1582-6333

[7]Pascu Emilia, 2013, Food goods - a global approach, Academic Publishing House, Bucharest, ISBN :978-606-591-667-8; Two: 10.5682/9786065916678

[8]Porumbăcean Claudiu, 2009, The politics and EU institutions, Ed "Vasile Goldis" University Press, Arad

[9]Radulescu D. M., Radulescu, V., Cetina, I., 2009, Establishing Legal and Ethical Principles in the prices of the goods and services, XIV International Metallurgy Review, Volume XIV, no. 3 ISSN 1582-2214

[10]Stoica Cosmin, 2013, Draft strategy for rural development in Romania, International Journal of Academic Research in Economics and Management Sciences. March 2013, Vol 2, No. 2. ISSN: 2226-3624, hrmars.com/admin/pics/1782.pdf

[11]<http://www.euractiv.ro>

COUNTRY MANAGEMENT - ARGUMENT FOR ECONOMIC SUSTAINABILITY

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Abstract

It is highly common the fact that political parties in charge should decide in the name of a nation the economic and social aspects. How can the decisional process be oriented towards ensuring a consensus in order to guarantee the population's welfare? How can the politicians look beyond the party's interests or the purely electoral interests? Why should politicians want the common good of the nations that they rule, even if for a determined period? A possible answer to these questions is the induction among the politicians from the top of the state's hierarchy the idea of national managerial team, with a determinist role for economic policies' national orientations.

Key words: *economy, economic growth, governance*

INTRODUCTION

In order to have a sustainable economic development, it is necessary a common effort between the public and private environment, with the goal of separating the economic growth from the excessive use of resources, having as main target the increase of life quality together with the decrease of environmental risks and social deficit. The transition towards a sustainable economy implies practicing an economy that is based on policies and investments that could, in their turn, make the connection between economic development, biodiversity, ecosystem, climatic changes and the population's health and welfare on a medium and long term. These premises must be interconnected in order to obtain durable development – considered the basis of repeating the economic growth at a global level.

Adam Przeworski appreciates that currently, democracies are facing challenges [9] which start from the issue of food providing and reach the problem of the answer to the population's discontent in what regards the socio-economic state, which imply the necessity of a strategy that would generate equality in the socio-economic field, make the

people feel that their participation to the political life is efficacious, ensure the fact that governments do what they are supposed to do, generate an equilibrium between following the rules and the non-interference in the justice act.

MATERIALS AND METHODS

In essence, the “country management” collocation derives from the rational approach of public goods, from the politicians' election on the basis of performance criteria and civic spirit, from implementing measures of sustainable and organic economic growth. I will try to define the concept of country management from two perspectives: that of economic strategy of governance and that of political parties and doctrines.

The basic strategy resides in identifying those aspects of material, cultural and institutional situations that could influence the decision regarding who needs to be involved in a certain situation, what actions can they undergo and their costs, the results they can obtain, which is the relation between actions and results, what information must be shared, how much control the individuals can exercise, the rewards that have to be aimed at

and for what combinations of actions and results [8].

This strategy will have to classify that precise type of societal issues according to the origin and manner of solving: institutional issues – specific to a certain governance – or structural issues, which imply the implementation of some reformation programs, that would lead to the sustainable development of economy. In this regard, the most stable institutions are those that are negotiated by the various political forces, eventually leading to stability. This fact is established in a consensual manner: democracy should give equal competition chances, and the institutions should produce functioning rules that would offer stability and the possibility of ensuring welfare for all the citizens.

In this sense, I propose a dynamic model for the management (as the opposite of the governance's structural model), that would provide the frame for understanding the nature of conflicts and the methods of solving them. Therefore, we can specify four more or less conventional frames, usually used in understanding the management process:

1. Considering a balance between legitimacy and efficiency;
2. Achieving the equality between the theory of leadership and research;
3. Considering the organizations as both formal structures and informal processes;
4. Considering the differences between the bureaucratic and the professional differences.

RESULTS AND DISCUSSIONS

In order to ensure the maximization of the citizens' welfare there is the need to assume a certain consensus towards the act of redistributing the public incomes. First of all, which is the modality by means of which one can assure that these public incomes grow? We need her to define an objective of the governance: the establishment of a stimulating fiscal policy for the business environment that would encourage labor and acknowledge the necessity of assuming social responsibility by each citizen.

Therefore, if we would understand economies as potential “growth mechanisms” [2] that need fuel in order to function, but also the agreement of both parts or primary components, so that it would promote in the most efficient manner entrepreneurship, innovation and economic growth, we could consider that the role of country management would be precisely the identification of the path by means of which the fruit of these economies would translate into welfare for all of us, provided the condition that the flux of incomes reaching the state through the taxation system is correct and equitably managed.

The “fuel” of an economy is represented by the right set of macroeconomic policies: mainly prudent fiscal and monetary policies, in order to maintain the low and relatively stable inflation and for preventing the long term diminishing of the economic activity to affect the economic growth [2]. In order to achieve these goals, it is required an institutional support by means of which economy would become sustainable and generate welfare:

- Public institutions must reward the entrepreneurial activity with social value, hence we cannot expect that individuals would risk their money and time in affairs that could end badly;
- Governmental institutions must discourage those activities that tend to divide the economic area, rather than extend it, through proliferating some disloyal and even illegal economic practices;
- Governmental institutions must be sure that both the successful entrepreneurs and the big companies continue to have stimuli for innovation and development.

Economic sustainability directions

By means of durable development (growth) we understand that ethical-economical rationality that ensures the preservation of the human society's existential conditions, on an indefinite period of time, at the level of the entire natural economic and social space accessed in the future. By means of actions centered on human development and entrepreneurial spirit, the society will ensure

for itself a potential of generating some rational economic behaviors, based on the efficient use of resources, on acknowledging the danger of using all the available resources, and implicitly the possibility of extending the market [3]. The economic process must be based on the reproducing capacity of some preexisting economic factors, with limited usability duration, which implies taking into consideration a limited ecologic capital stock.

The problem of economy is how it is going to potentiate this ecologic capital stock. In this sense, it is taken into consideration the process of producing and distributing the incomes in order to sustain the actions of producing economic welfare. There will be taken into consideration the following:

- The production of economic goods allotted through the market, desiring the intensive utilization of economic resources;
- Defining the term “decent” and identifying those limits that would allow the preservation of some expected levels of economic utility at the various fluctuations of the income’s level;
- Generating economic incomes that would ensure the premises of a decent life level;
- Imposing a specific institutional measure of the income generated by the taxation levels;
- The supportability degree of the private system’s economy that generates taxable incomes from productive activities, of the passive, aproductive beneficiaries. It is taken into account the fact that the sustainable development of economic resources implies the process of training in the economic activity of all the work resources, generating an active, creative and participative behavior.
- The transferability of economic resources, inclusively at the level of the local economy, which implies approaching the economy on the principle of relative advantages, the efficient use of the productive potential, the increase of the complementarity degree between economic regions, the stability of market relations strictly on competitiveness criteria.

The economic governance strategy

Traditionally, the state is responsible for the production and distribution of public goods.

The state, in exchange for some financial transfers under the form of taxes, can realize public goods that would lead to the growth of the citizens’ welfare level. We try to eliminate the population collocation, as we will use citizens [1], although in our opinion, the right one would be people [2]. It is clear that an individual’s citizen attribute refers to his institutional relation, to the action by means of which the state convince him to accept a form of institutional collaboration and to be a correct player in his relation to the state.

The life environment is the only quasi-unlimited provider of material elements that are extremely important to the existence of the human being, as well as the only source of contacts and emotions that are part of the biological quintessence of human being. From this point of view, the natural component has an importance that must be highly recognized and respected. On the other hand, the artificial component of the life environment is also very powerful, whose favoring – in the detriment of natural environment – has been the source of the major disequilibrium registered today at the scale of the planetary ecosphere.

Table 1: Components of human life environment

<i>Natural environment (NE)</i>	1. richness and biological diversity of natural environment (NER), 2. aesthetic satisfactions and comfort provided by natural environment (NEC), 3. scientific developments determined by the natural environment (NES) $NE=NER+NEC+NES$
<i>Anthropized environment (AE)</i>	1. the richness of useful artefacts created by man (RAE), 2. aesthetic satisfactions and comfort offered by the anthropized environment (CAE), 3. scientific developments related to the anthropized environment (SAE) $AE=RAE+CAE+SAE$
<i>Social environment (SE)</i>	1. the richness of social relations in which the human being integrates (RSE), 2. the comfort and security degree offered by the social environment (CSE), 3. scientific developments related to the social environment (SSE) $SE=RSE+CSE+SSE$

The analogy between state's rulers and entrepreneurs made us believe in the "country management" concept. The citizens, as well as the agents, could do better if they accept the coercion exerted by the leaders. If the efforts are successful, the leader appropriates a substantial part of the surplus [3]. In this case, there isn't a mechanism that would resemble the market competition and that would exert over the leader the pressure of developing efficient institutions. He could confront rebellions, if the measures that he will choose would be too oppressed; this fact will consume according to the people's reaction capacity.

In the case of the leader, the surplus will appear from the taxation of economic goods produced in the real economy, the coercion being the taxation rate that equals an institutional measure of adjusting the profit, respectively the surplus.

The dualist approach between the firm's theory and the state's theory implies that the task of organizing collective actions belongs to a single individual, whose incomes are directly related to the produced surplus. Both theories imply the existence of a person from the exterior, who would assume the fundamental responsibility of executing the required changes inside the framework of the existing institutional rules in order to coordinate the activities. The entrepreneur or the leader must take a credible commitment of punishing anyone who does not follow the firm's or state's rules. As they are the ones to keep the surpluses, it is their interest to punish this disobedience when they are confronting this aspect. Consequently, their threats according to which they would apply sanctions become credible. Moreover, it is in their interest to monitor the previous agreements [4].

Who and what part does this person from the outside play, according to Elinor Ostrom? The need of an self-organized and self-managed collective action has as premise the fact that individuals cannot organize themselves, but they always need authorities from the outside to do this in their place, which strengthens the conviction that it is good to develop a regulation authority or that, for monitoring or

implementing the auto-negotiated contracts, it is required a secure juridical system.

In the specialty literature there are theories that sustain the fact that the common management of public goods is most of the times doomed to fail. This fact indicates the necessity of privatizing the common goods in order to determine an individual or an institution that would be able to obtain a result from an action on the goods and, in a contrary case, could be submitted to a coercion process. Both the economic analysis of the resources placed in common property and Hardin's theory on common goods' tragedy made Robert J. Smith suggest that the only manner to avoid the tragedy of common goods is to end up the common property system by creating a system of rights over the private property [4]. Smith underlined the fact that when we consider a resource to be in common property, we become stuck in an inexorable process of destroying it.

Therefore, in Elinor Ostrom's opinion, the only way of solving the problem of common goods is by means of X. The content of X is extremely variable: either a central authority that would assume the constant responsibility of taking unitary decisions (the centralization of the decisional system) or a central authority that first has to allot property rights and only then allow the individuals to follow their own interests in the limit of well - established property rights (privatization). In both cases, the institutional change must come from outside and must be imposed to the individuals involved. If we talk about common public goods, the solution of privatization is feasible as it allows the individuals to obtain very good results [1]. When referring to institutions and who should "produce" their efficiency, we could define our "country management" concept as that technocrat or political party affiliated entity, nationally established, with regional or local ramifications, which militates for guaranteeing an optimal institutional frame for realizing common socio-economic activities and not only, necessary for ensuring and increasing the citizens' welfare.

A "wise/efficient" country management uses the so gained resources (by means of taxing the

economic goods created inside an economy and the consume of the economy's subjects) in order to increase the general level of the economic and social welfare (creating public expenses through redistributing the state's incomes) sufficiently enough so that it could increase the income tax (in fact, through increasing the chargeable base in the conditions in which economy is currently developing as a result of the business environment's competitiveness) and reduce the use of coercion (which would consist of the impossibility of the access to public goods, respectively the lack of living possibilities for the individual and his family).

We can identify many attributions belonging to country management, residing from the need of ensuring and generating welfare and sustainable development for an economy, in the context of generalizing the penury /precarious state of economic resources.

Hence, we take into consideration:

- Attributions necessary for human development's sustainability
- Attributions necessary for ensuring the economic sustainable increase
- Attributions necessary for reaching prosperity in an economy based on knowledge
- Attributions necessary for ensuring the individual's and the community's security
- Attributions necessary in order to transmit the manner of understanding the significance of the predominant economic system, that would also be eligible for ensuring democracy and welfare.

Responsibility

Perhaps the most important characteristic of the "country management" concept is assuming the responsibility of the decisional factor, regardless the level, and the introduction of a system for measuring the results after establishing the action plan on a determined period of time [7].

This analysis also takes into consideration the utility of economic policy measures reflected in the economy by means of monetary-fiscal tools (the monetary policy interest's rate, the imposition rate, the rate of exchange, public incomes, public expenses etc.) which influence

in a decisive manner the consumer's behavior. This will purchase/consume a public good generated as a result of the implementation of an institutional policy measure in the case in which the marginal utility of the public good (the additional satisfaction resulted from consuming an additional unit from the public good's sphere) will surpass the paid price for purchasing/consuming the public good. In the contrary case, he will not purchase this good or will become a clandestine consumer [8].

It is necessary for those taking the decisions in what regards the public policies to adopt a rational economic behavior, based on efficiency indicators in using the resources, belonging to the "maximizing the useful effects and minimizing the consume" type [5], being necessary to take any kind of public policy decision that would have the lowest opportunity cost.

In essence, we refer to a new vision of the state, of the state's role in generating stimuli for creating and preserving richness [2]. Why richness? How will be richness used in what regards the human growth and development, the individuals' and the community's socio-economic welfare or a sustainable economic development? The initial problem is that of defining correctly the richness and the factors which compete when it comes to preserving and increasing the richness and the sustainability concept. What does it contributes to the transformation of richness into sustainable development? What is necessary and sufficient for ensuring a compatibility level between the human synergies in order to generate human development models or schemes? [4]

All these questions will find a kind of answer or solutions with a certain realization probability degree in the conditions in which it can be built a model of sustainable development based on existent and potential economic resources, state's support, entrepreneurial motivation, the functionality of business environment based on the market's functionality, ethical principles at a societal level or social responsibility.

Why do we need a new vision over the concept of governance?

In essence, we refer to a new vision over the state, the state's role in generating stimuli for creating and preserving richness. Why richness? How will richness be used in what regards the human growth and development or the individuals' and the community's socio-economic welfare?

The initial problem is that of correctly defining richness and the factors that compete towards the conservation and increase of richness, respectively the concept of sustainability. What are the elements that contribute to transforming richness into sustainable development? Can we talk about richness at various levels – community, state – without favoring human development? What is it necessary and sufficient for ensuring a compatibility level between human synergies in order to generate human development models or schemes? Is it possible a human development model without prejudicing individuality and free will?

All these questions will find a kind of answer or solutions with a certain degree of realization probability in the conditions in which it is being built a sustainable development model based on economic resources – existent and potential –, state's support, entrepreneurial motivation, business environment's functionality based on market's functionality, ethical principles at a societal level or social responsibility.

CONCLUSIONS

This paper looks at a certain plea towards the state's reconfiguration on the institutional market, considering valid the hypothesis according to which the state and the market are two institutions that do not exclude each other, are competitive and complementary. This is the perspective from which we must analyze the state's institution in the context of the lost of confidence in this institutions from the part of economic agents, consumers and employees, assisted persons, as a result of the growth of the failure degree commensured through bankruptcies, decrease of the purchasing power, unemployment, reductions of pensions and other forms of social assistance.

Another side of the "state's institution's problem" is the issue of registering some limits in relation to the wealth stimulation possibilities, respectively ensuring sustainability on a medium and long term. The management of some big social problems, meaning that of the social costs resulted from implementing unhealthy and unsustainable public policies, does not represent anymore an appanage of the state in its current form. The modern state must acknowledge the limits of economic growth, social problems generated by the global ageing of population, the rarity of conventional resources, mutations on the map of geopolitical resources and the appearance of some economic power poles, the limits of the globalization process with perverse effect at a social level.

REFERENCES

- [1]Apostol Diana, 2011, Prospects New Economy. Effects on Romanian Academy (PhD Thesis)
- [2]William Baumol, Robert E Litan, Carl J. Schramm, 2009 Capitalism good, bad capitalism and the economics of development and prosperity, Publishing Polirom, Iași
- [3]Cofas Elena, 2013, Objectives and requirements relating to the sustainability of romanian agricultural production, International Scientific Symposium "Managing Sustainable Rural Development", Timisoara, Scientific Papers, Series I, Vol XV (1)
- [4]Stoica Cosmin, 2013, The Role of the Economist in Economic Life, Vol 2, No. 2 ISSN: 2226-3624 49 www.hrmars.com
- [5]Dinga Emil, 2009, Studies economics. Contributions of logical analysis, epistemological and methodological Publishing House, Bucharest
- [6]Holcombe Randall G., Public Sector Economics, Wadsworth Publishing Company, California, 1998;
- [7]Nicolau Irina, Musetescu Adina, Tilea Doina Maria, 2010, The innovation process - mandatory for the companies' development, International Scientific Conference ECO-TREND 2010 VIIth Edition, ISBN: 978-973-144-409-3, Ed . Academic Brancusi, Tg. Jiu.
- [8]Ostrom Elinor, 2007, The government of the commons. The evolution of institutions for collective action, Publishing Polirom, Iași.
- [9]Przeworski Adam, 2010, "Democracy and the Limits of Self-Government", Cambridge University Press, <http://voices.washingtonpost.com/political>
- [10]Radulescu, D.M, Radulescu, V., Cetin, I., 2009, Establishing legal and ethical principles in the prices of the goods and services, International Metallurgy Review, Volume XIV, no. 3 ISSN 1582-2214

STUDIES REGARDING THE DENSITY DYNAMICS OF *AVENA FATUA* WEED SPECIES ON WHEAT CULTIVATED IN MONOCULTURE (2 AND 3 YEARS) AND IN THE WHEAT–RAPE CROP ROTATION ON BURNAS PLATFORM (ALEXANDRIA)

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Abstract

Until 1995, the *Avena fatua* (odos) wasn't even known as a weed in Burnas Plain wheat crop. Starting with the beginning of the first decade of the millennium, also fostered by the climate change process, *Avena fatua* has been slowly, but surely, installed in the area. By 2010 it reached almost 50 plants/m² on wheat after wheat and about 90 plants/m² in 3 years wheat monoculture. Over the past three years, the specie's density has logarithmically increased up to 600 plants/m² on wheat after wheat and to almost 900 plants/m² in 3 years wheat monoculture. The surfaces identified by us have exceeded 1500 ha, while the yield losses reach up to 100%. In these conditions, the rape-wheat simple crop rotation reduces weed infestation and keeps it slightly variable between 5-10 plants/m², well below the economic threshold of tolerance. At the same time, substantive amendments in weed's biology and ecology were observed, it becoming therophytes - hemitherophytes due to climate change. Can talk about a weed infestation of the crop with biannual and annual forms. Between all the chemical methods used so far, very good results were obtained with the Pallas 75 WG product, at a dose of 150 g/ha, even without safener.

Key words: *Avena fatua*, Burnas Plaini, control, density, weed infestation

INTRODUCTION

The registered increase of *A. fatua* species in the Romanian territory occurred in several stages. It was brought from the Central and Northern parts of the country once with the migration process – of combines, as well as of seeds. In the middle of Transylvania the studied weed lies there for more than 50 years, its number and mass easily competing plants like wheat, barley etc. Depending on the soil and climate conditions, but also on the crop, the competition index ranges between 0.35-0.45, being 1.8 times more competing than *Apera spica-venti*, with whom practically shares the same attack area [5][6].

In the South part of the country, in terms of very long dry autumns, followed by mild winters, the weed finds the best conditions for growth and multiplication. Such a situation was registered in the agricultural year 2012-2013, but also in 2010-2011.

Some studies previously performed on soils from the center of Transylvania show that, in normal years, to weed infestation with *A. fatua* in 4 years wheat monoculture are found 430 plants/m² [4][7]. A simple crop rotation of 2 years (wheat – maize) has reduced the weed infestation by 55%, a triple one (wheat – maize – soya) by 80%, and a 4 year crop rotation (wheat – maize – soya – sunflower) by 95%, placing it significantly below the pest threshold.

According to our estimations, as well as of those made with Corlaus and Nagy (1980) [8], the economic damage threshold of *A. fatua* varies, for wheat, between 8-18 plants/m².

Researches regarding the *A. fatua* weed biology of, but also of its effects, were conducted at the Tg. Mures, Turda, Suceava, and Livada experimental stations [8][7]. Each time the results proved to be different from one zone to another. The results were published in different editions of the INCDA Fundulea Annals.

In the LXXV Volume, anniversary volume, Alexandrina Popescu [1] makes a synthesis regarding the *A. fatua* control, indicating as main efficient herbicides the mixtures of Icedin Forte with Avadex BW, with Tolkan S., Avenge, Suffix BW, Mataven and Illoxan, with yield increases of 440-840 kg/ha, but only for densities of *Avena* species that haven't exceeded 280-380 plants/m².

Returning to the biology and ecology of the species, we emphasize that from an ecological point of view it is "xeromesophyll – mesophyll, eurythermophilic, low acidic - neutrophil" [3]. The Weed Atlas, published in 2002 [3], doesn't find the species in the Alexandria region other than sporadic and most often as ruderal plant. In the biology of the species happened events that have changed both its biology and its ecology.

The seed movement and the species multiplication facility are favored by a pappus of piliferous, particularly placed at the base of the seed, while in some thermophilic ecological forms they extend over the entire surface of the seed (Fig. 1).



Fig. 1. Different seeds of *Avena fatua*, originated from different ecological zones in The United States territory (Source: USDA) [9]

MATERIALS AND METHODS

Object of research: analyzing ecological explosion of *Avena fatua* species in Burnas Plain – causes, damage and protection measures for cereal crops (wheat, in particular).

Aim of the research: the establishment of new biological and ecological parameters encountered by *Avena fatua* in Burnas Plain

and the design of some researches on avoiding damages.

The research work was done directly in the sowing field, where plots were demarcated in 4 repetitions for each variant.

The following versions were used:

1. Wheat after rape (W.R.);
2. Wheat after wheat (W.W.), 2 years monoculture;
3. Wheat after wheat, after wheat (W.W.W.), 3 years monoculture.

Weed density determinations were carried out from 5 to 5 years, from 1995 to 2010, after which they were performed annually due to the increased intensity of their density. The result was a number of measurements of $7 * 4 * 3 = 84$.

The main tracked parameters were:

- a) Number of weeds/m² (density);
- b) Changes in biological and ecological characteristics of the species;
- c) Possibilities of weed combat using agrotechnical and chemical methods.

Data collected have been interpreted using the statistical calculation of dispersal analysis, the "student" distribution version, as well as model calculations of correlation analysis in 2D and 3D.

The results are presented in the form of graphs and tables.

RESULTS AND DISCUSSIONS

Although the studies continues, we are able to specify that the weed has particularly changed its ecological characteristics and, potentially, some of the biological ones.

Biological form of *Avena fatua* is therophytes [3]. That means that it is a spring annual plant, which multiplies by seed. Otherwise, this should also be the form of hibernation. Normally, it can't pass the winter in the form of a plant, as it happens with most of the winter crops.

From our observations we noticed that, especially in years with long autumns and mild winters, such as 2010-2011 and 2012-2013, the plant becomes hemitherophyte or therophyte – hemitherophyte. It is an ecological modification that, at least in the

recent years, transformed the plant from an annual to a biannual one. Long and sometimes wet autumns (toward winter) forces *Avena fatua* to germinate from autumn (Ist year) and, because of warm winters, to bear well this period of time, entering into the 2nd year of life, when it completes the cycle and throws its seeds.

The species transformation into a one even potentially hemitherophyte explains, in fact, its great capacity for multiplication. Vigorous growth in autumn, which is completed with spring emergence, forms a chain of annual and biannual plants that completely stops the wheat growth (Fig. 2). The thermic conditions are more favorable than those in Central Transylvania and the acido-neutral soil helps to the favorable ecological characteristics completion [2][7].



Fig. 2. Wheat field compromised by *Avena fatua* (author's photo, Alexandria – 09.05.2013)

1st variant. The density dynamics of *Avena fatua* on wheat in R.G. rotation demonstrates that in the early years (1995) on wheat after rape *Avena fatua* was very difficult to find, in 2000 we see that it reached to over 2 plants/m², in the next five years it has doubled, reaching nearly 5 plants/m², so that for the period 2010-2013 to have a logarithmic growth, but on small areas (under 12 plants/m²) – Fig. 3.

The calculated dynamics, although it is a complicated function, it is accompanied by a correlation ratio of less than 0.5, ie the possibility of repeating this equation is less than 50%. The density game being carried out

under 12 plants/m², it is found in the technical-economic non-damage limits and, in conclusion, wheat after rape doesn't require treatments.

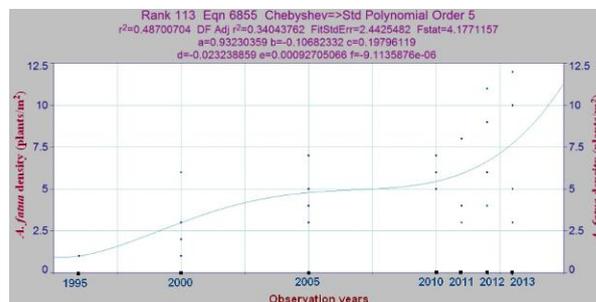


Fig. 3. The *Avena fatua* density dynamics on wheat after rape – W.R. system (1995-2013) in Alexandria

2nd variant. Wheat is cultivated after wheat (Fig. 4). The density dynamics shows that in the first 10 years of observations the *A. fatua* density remained in the tolerance thresholds, but then, in the years 2005-2013, has grown exponentially, in 2013 reaching to 600 plants/m². In this case wheat was muffled and 100% compromised (also see Fig. 5).

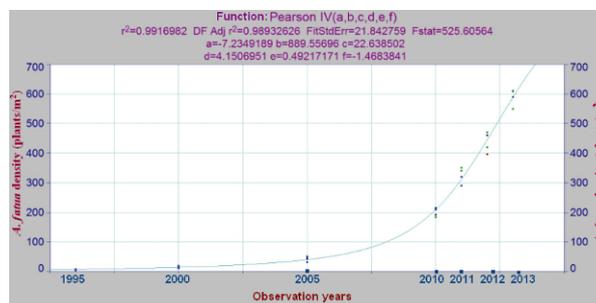


Fig. 4. The *Avena fatua* density dynamics on wheat after wheat - W.W. system (1995-2013) in Alexandria



Fig. 5. Lower density of *Avena fatua* (460 plants/m²), but very dangerous (author's photo, Alexandria 2013)

3rd variant. Wheat is cultivated three years in a row, in monoculture (Fig. 6).

In the first 10 years the graphical form of the function is similar to the one from Variant 2, with the specification that the density values are somewhat higher.

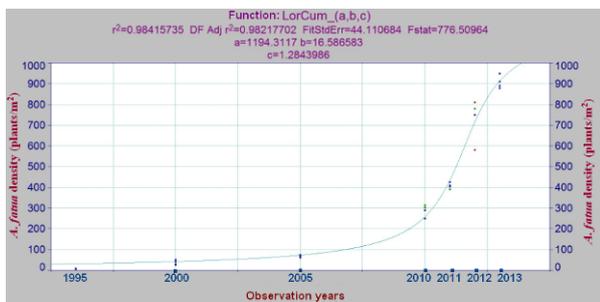


Fig. 6. The *Avena fatua* density dynamics on wheat after wheat, after wheat – W.W.W. system (1995-2013) in Alexandria

However, starting from 2010 the increase is explosive, easily reaching over 900 plants/m² (Fig. 7).



Fig. 7. Untreated field, with 870 plants/m² (author's photo, Alexandria 2013)



Fig. 8. Atrium wheat field treated with Pallas WG in autumn 2012 ⇒ 98% combat (Alexandria 2013)

It is obvious that, without chemical intervention in these conditions no crop is no longer possible. By doing the treatment with Pallas WG 150 g/ha it was obtained wheat like the one in Fig. 8.

In Fig. 9 is presented the model in 3D of the *Avena fatua* density dynamics according to the 3 working variants.

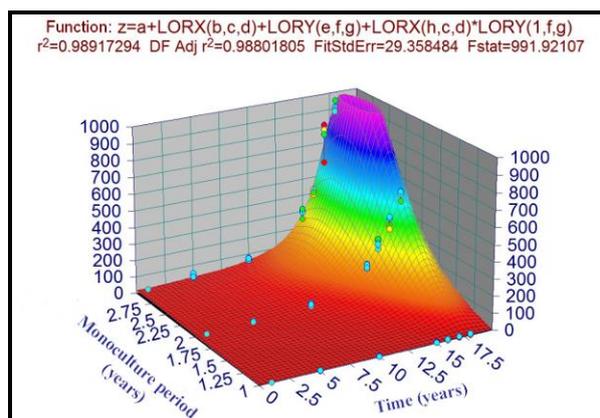


Fig. 9. The density dynamics (1995-2013) of *Avena fatua* plants depending on the length of wheat monoculture

- x = time, in years
- y = monoculture length
- z = *Avena fatua* plant density

$$z = f(x * y), \text{ LOR type function}$$

The model indicates a low agitation of the density during the first 10 years of observations, but a very agitated one afterwards. In the first 5-10 years of observation the density rarely exceeded the economic pest threshold, but thereafter the 3 years monoculture it produced a 50% higher density, leaving no chance to the wheat yield.

In Fig. 10 it can be observed that in the W.W.W. untreated system rarely appears a wheat plant.



Fig. 10. High density of *Avena fatua*, compromised field (original, Alexandria 2013)

Chemical treatments

For wheat monoculture chemical control it has been chosen the product Pallas 75 WG (Dow Agrosiences), that contains 7,5% pyroxsulam and 7,5% a cloquintocet-methyl safener (adjuvant).

In contrast to other research and taking into account the previously facts, the treatments were carried out in autumn, after the rains from the end of October, at a dose of 150 g/ha + adjuvant.

No other treatments were done in the spring.

The results concerning the reduction degree in weed infestation are presented in Table 1.

Table 1. The combat degree of the *Avena fatua* species with the product Pallas 75 WG in 2012-2013, on wheat crop in Alexandria (Astaro variety, chernozem soil with 34% clay, autumn treatment)

	2 years monoculture density		3 years monoculture density		Crop rotation rape/wheat density	
	No.	%	No.	%	No.	%
Untreated	550	100	890	100	5	100
Treated	5	0,9	7	0,8	0,5	10

In Fig. 11 are presented, in comparison, a plot treated with Pallas 75 WG (left) and an untreated plot (right).



Fig. 11. The difference between the untreated control version (right) and treated with Pallas 75 WG (left) (original photo, Alexandria 2013)

It follows that the wheat had no chance against this high density, doubled by the extremely vigorous bio-ecological form of the weed (Fig. 12).



Fig. 12. Bio-ecological form highly vigorous photosynthetic and mesophilic (a, b) of *Avena fatua* in 2013 (original, Alexandria 2013)

CONCLUSIONS

In the past 3-4 years in the Plain Burnas has appeared an extremely vigorous form of *Avena fatua*, this having a hemitherophyte and partial therophyte biological form. The biannually form of this new biological construction gives to the weed an increased force of competition, both as density, as well as like vigour.

The registered densities have been of 600 plants/m² on wheat after wheat, of 900 plants/m² on wheat – wheat – wheat system and of only 5 plants/m² on wheat after rape. At least 60% of the hemitherophyte fructified at W.W., while at W.W.W. this percentage was of 50%.

As a previous plant, rape has an excellent ability to control the weed without any other investment in synthesis chemistry.

The Pallas 75 WG herbicide at a dose of 150 g/ha + safener had an efficiency of about 99% in weed control, that if the treatment was carried out in autumn, in the middle of weed's vegetative growth.

REFERENCES

- [1] Popescu Alexandrina, 2007, Rezultate experimentale privind combaterea chimică a buruienilor din culturile de câmp, Analele INCDA Fundulea, Vol. LXXV, Volum Jubiliar
- [2] Berca, M., 2004, Managementul integrat al buruienilor, Editura CERES, București
- [3] Chirilă, C., Ciocârlan, V., Berca, M., 2002, Atlasul principalelor buruieni din România, Editura CERES, București
- [4] Berca, M., 1996, Al X-lea Simpozion Național de Herbologie „Combaterea integrată a buruienilor”, Sinaia, pg. 7-16
- [5] Berca, M., 2011, Agrotehnica, transformarea modernă a agriculturii, Editura CERES, București
- [6] Berca, M., Tănase, Gh., 2000, Al XII-lea Simpozion Național de Herbologie „Combaterea integrată a buruienilor”, Sinaia, pg. 23-34
- [7] Ciorlăuș, A., 1996, Al X-lea Simpozion Național de Herbologie, Constanța, pg. 11-22
- [8] Ciorlăuș, A., Nagy, C., 1980, Folosirea rațională a erbicidelor, Pitești, pag. 49-54
- [9] USDA, Natural Resources Conservation Service, *Avena fatua* (wild oat), AVFA, <http://plants.usda.gov/java/profile?symbol=AVFA>

EFFICIENT USE OF SOME AGRICULTURAL RESOURCES IN THE WEST MEDITERRANEAN REGION OF TURKEY WITH SPECIAL REFERENCE TO ISPARTA PROVINCE

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Abstract

In this study, the efficient use of some agricultural resources in the West Mediterranean region of Turkey with special reference to Isparta Province to improve agricultural productivity was examined. The study area has a great agricultural production potential in terms of fruit and animal production. However, it lacks due to the inefficient use of irrigation water resources and grassland areas. The current status of animal production and water and grassland resources is presented. There is a need to create and utilize new natural resource management strategies in the region in order to develop and improve animal production. Therefore, efficient utilization of water and grassland resources and their contributions for improved production level are discussed and suitable grassland and water resource management systems are discussed and some recommendations are made.

Key words: animal production, grassland, irrigation, management, Mediterranean, water

INTRODUCTION

As world population increases famine became one of the issues world facing and thus using resources efficiently has gained importance. Hence, it is required to improve productivity by implementing recent developments in agriculture. Turkish agricultural sector has several issues facing such as low income, small farm size, low productivity, lack of knowledge using technology. In addition, having less educational level of farmers is an obstacle to follow and use the new technology. In order to reduce poverty in agricultural sector in Turkey it is necessary to introduce and implement some agricultural development programmes and projects which bridge the gap between new technical knowledge and farmer practices.

Isparta, a city located in Mediterranean region of Turkey, with Mediterranean climate and terrestrial climate is a transition sub-region and is close to some major cities and occupies 8933 km² area. In terms of development level, Isparta is ranked as 41 among 81 provinces in Turkey. Significant share of

population lives in rural area (%43) and work in agricultural sector (%55) in Isparta province. Horticulture, animal production, field crops, and vegetable growing are major agricultural activities in Isparta.

A significant portion of the land area planted in Isparta province consists of very steep and precipitous slopes, and a portion of the land under forest-shrub cover, some of which is pasture or bare rocks. Various factors such as lack of pasture and grassland and feeds for feeding livestock have been effective for under development of livestock sector in the region. But in recent years due to better returns on livestock production the demand for animal husbandry is increasing. Therefore, this study was aimed to evaluate efficient use of some agricultural resources in the west Mediterranean region of Turkey with special reference to Isparta Province.

MATERIALS AND METHODS

The analysis of the efficient use of some resources in Isparta region of Turkey is based

on the own research work, remarks, studies, comparisons and also on various results obtained by other researchers regarding animal production, grasslands, pastures and water resources. Also the remote sensing GIS were used in order to determine the grassland area.

RESULTS AND DISCUSSIONS

Animal Production in the Region

Livestock farming in general are carried out under intensive conditions and seen as very small family businesses. However, extensive animal growing is more common in rural areas. Keeping local and cross breed of animals is very common but using European pure bred animals for animal husbandry has been increasing gradually [1].

Small farmers living mostly around mountainous, hilly, forested terrain and in difficult conditions and utilizing pastures for the need of feed supply for animals prefer local breeds generally. In Isparta the number of local breeds, pure breeds and cross breeds account for 26%, 20% and 54% respectively in total number of cattle[2].

Grasslands, Pastures and Water Resources for Animal Production in the Region

Meadows and pastures are the most important food sources that animals need for feeding. The meadow-pasture areas occupy 82 869 ha in Isparta with a total of 9% represents the whole area, and with very low-quality pasture and rangeland areas [3].

As in other parts of the country, in Isparta also rangeland pastures have been lost due to overgrazing and early grazing and became unable to meet food requirements of the animals [4].

Use of pasture areas in the forest also protects the forest and rangelands from natural disasters such as fires and erosion. The other measure for prevention of erosion that should be taken, without being subject to any rules, is the improvement of grassland, pasture in the area and alpine pasture utilized by domestic and wild animals as food sources [5].

According to the completed pasture limitation studies in the province, 4,550 ha area of 12

527 ha grassland area consist of steep and very steep slopes which represents 36.32% of all grassland area [6], these are very important factors increasing the risk of erosion. Isparta region, some of the pasture vegetation structures and the relationships between soil properties and topographic factors were examined in a study [7], pasture lands textured loam and clay loam, respectively. Depending on the elevation, CaCO₃% of the decrease (3-9%) and the increase inorganic matter (2.60-3.90%) reported to be associated with the intensity of grazing or climatic conditions. Areas of pasture land in question, they are susceptible to erosion on the basis of dispersion rate property. More over, taken into consideration the size of plant covered area used against erosion, it is stated that varies with the seasons and years, altitude, land use and land status.

Soil and Water Resource

In the province of Isparta, Corine land-use classification system is identified as, artificial surfaces 9910.8 ha, 237 030.8 ha of agricultural areas, 565 738.7 ha of forest and semi-natural areas, 3668 ha of wetlands, 62 719.2 ha of water bodies [8].

Total area of Isparta is 8,983,307 ha. The most common major soil groups in the province are listed as brown forest soils (17.7%), red brown Mediterranean soils (14.5%), chestnut soils (14.4%), noncalcic brown forest soils (9.6%), noncalcic brown soils (7.3%), colluvial (7%) and alluvial soils (6.3%) [8]. The amount of irrigatable area was determined as 97,166 ha [9].

The largest water source of the Isparta is Eğirdir lake (907 million m³/year). Otherwise, surface water potential with the Aksu River emerged in Sütçüler town is 1784 million m³/year. Furthermore, available groundwater potential is 120 million/year. When added irrigation water received from Beyşehir lake, total water potential of Isparta reaches up to 1989 million m³/year [10, 11].

Isparta has ten large (>1000 hectare) irrigation schemes. These are Atabey, Bogazova, Gelendost, Hoyran, Senirkent, Sarkikaraagaç, Uluborlu, Yalvaç, Yenisarbademli, and

Yılanlı irrigation schemes. The total irrigation area of these irrigation schemes are 53,348 ha.

Table 1. Some of the features of the irrigation schemes for the years 2004-2008 in Isparta Counties [12]*.

Irrigation Scheme	Irrigation Area (ha)	Irrigated Area (ha)	Irrigation Ratio	Diverted Irrigation Water (hm ³)	Water Requirement (hm ³)	Water supply of Ratio (RWS)
Atabey	14000	3977	28	56818	16478	3.45
Boğazova	1800	1629	91	16051	9634	1.67
Gelendost	4335	2630	61	23134	13054	1.77
Hoyran	2800	1319	47	11290	4854	2.33
Senirkent	8079	4085	51	36481	16644	2.19
Şarkikaraağaç	13180	1082	8	24362	4740	5.14
Uluborlu	1640	1474	90	8925	5821	1.53
Yalvaç	1800	331	18	5325	1355	3.93
Yenişarbademli	2490	492	20	10453	2369	4.41
Yılanlı	2800	961	34	11181	4482	2.49

*Average values for the years 2004-2008

Irrigation areas, irrigated areas, diverted water volume, irrigation water requirement, irrigation ratio and rate of water supply (RWS) of these irrigation schemes in 2004-2008 are shown in Table 1. Irrigation ratio and RWS are two basic indicators used for efficient land and water use. The lowest irrigation ratio was realized at Sarkikaraagac irrigation scheme (8%), whereas the high irrigation rate was occurred at Bogazova irrigation scheme (91%) in the specified years. According to the total irrigation water requirement, the rate of water supply equals to 1 indicates that water is diverted at a level to meet the requirement, while a water supply ratio smaller than 1 indicates that water less than required is diverted, and if it is greater than 1 indicates that water more than required is delivered. According to this indicator, the most efficient irrigation water use was realized in Uluborlu (RWS: 1.53), Boğazova (RWS: 1.67) and Gelendost (RWS: 1.77) irrigation schemes (RWS: 1.53), respectively. Irrigation water was applied 5.14 and 4.41 times more than needed in Sarkikaraagac and Yenisarbademli irrigation schemes. Therefore, it is impossible to mention in these irrigation schemes an efficient use of water. Related with this study in these irrigation scheme, Uçar (2011) [13] reported that the highest Output per Unit Command Area (OUCA) values were in Bogazova irrigation scheme (US\$38.724 and US\$34.907 per ha,

respectively) in 2007 and 2008, followed by Gelendost irrigation scheme (US\$23.168 per ha) in 2007. On the other hand, the lowest OUCA values were in the Sarkikaraağaç (US\$397, US\$450, and US\$455 per ha, respectively) in 2004, 2008 and 2006.

Determination of Grassland Areas by Remote sensing and GIS

Using today's technology will ease the time and labor for the identification of grassland and pasture areas. In this respect, the Geographic Information System (GIS) built on computer technology enhances research, planning and management and the decision-making capabilities. In recent years, estimation of biomass production of pasture using remote-sensing (RS) techniques is developing very fast. RS and GIS are being used increasingly as tools to assist in grassland resource inventory and integration of data and as a mechanism for analysis, modeling, and forecasting to support decision-making [14].

Integration of these technologies has been reported to be used in many areas of agriculture as well, especially for land use and grassland management. Excessive grazing of pastures and meadows and incorrect land utilisation are major causes of depletion of grazing land which is a critical resource for animal production. For this reason determination of grazing lands within the province becomes very important issue to be used for animal production and effective

grazing management. Therefore, it is possible to determine the grassland types and grazing systems using satellite images and to evaluate grassland quality using GIS and RS techniques [15]. RS and GIS have played an active role in monitoring and determining changes in environment (Erdin et al., 2002) [16].

Recommended Grazing Systems in the Region

There is evidence that some rotation grazing systems give equal or superior vegetation, livestock, and financial performance to continuous grazing [17]. The division of the grassland into paddocks through electrical fencing allows for the splitting of herds into various groups. Furthermore, the short grazing periods applied in the rotational grazing are beneficial because they can increase the carrying capacity of the pasture without grasses being damaged. Moderate stocking rates would be appropriate for the pastures in the grassland areas which can provide better vegetation for grazing purposes. As suggested by [18] selection, design and implementation of best proper irrigation methods based on land characteristics and implementation of proper irrigation programs will provide an effective water resource utilization and preservation. With the implementation of pressurized irrigation systems water losses and excessive water use and consequent negative effects on environment will be prevented. Water pricing should be based on volumetric consumption instead of crop-area basis.

CONCLUSIONS

The rangelands in the area are of great importance for the people of the region who engage in livestock production. The existing pastures can be utilised by the implementation of rotational grazing as an efficient grazing system.

Determination of the grazing areas by using geographic information system and remote sensing technology will certainly create a new food source for the improvement of both livestock sector and rural socio-economic situation of the farmers in the province, and

will contribute to the protection of cultivation areas and soil from erosion and fire disasters. Since the land consolidation, leveling and drainage like in-land development services are not completed over the land resources, a sustainable water management is not achieved. The region is not at the desired level in terms of the effective use of water resources, especially in terms of rates of irrigation and water supply rate. Moreover, irrigation canals, canals, architectural structures and gauging facilities are exposed to external conditions (precipitation, flood, wind, ice, temperature) and damages caused by the users, they get out of order in short time and they require maintenance and repair. Since there are intermediate storages in canal networks and night irrigations are not made during the irrigation season except the peak seasons some water diverted to network flows to discharge. Fulfillment of these deficiencies may increase water use efficiency in the region.

It can be concluded that in this region where the economy is based on animal and horticultural production, determination of grazing areas, water resources stocking rates, estimation of biomass available for grazing, the length of vegetation period and monitoring the change in those areas must be included in Regional Development Plans for the improvement of agricultural development in the Region.

REFERENCES

- [1] Uzun N. & Bozkurt Y., 2010, Isparta'da Hayvansal Üretim ve Geleceği, Isparta Değerleri ve Değer Yaratma Potansiyeli Sempozyumları. 26 Nisan-3 Mayıs 2010, Isparta.
- [2] Anonymous, 2007, Agricultural Statistical Year Book.
- [3] Anonymous, 2010, Statistical Year Book, T.C State Statistical Institute, Ankara.
- [4] Babalık, A. A. 2007. Davraz Dağı Kozağacı Yaylası Merasında Bitki ile Kaplı Alan ve Otlatma Kapasitesinin Belirlenmesi Üzerine Bir Araştırma, S.D.Ü. Orman Fakültesi Dergisi, Seri A, Sayı: 1, Sayfa: 12-19, Isparta
- [5] Konukcu M., 200, Ormanlar ve Ormancılığımız "Faydaları, İstatistikî Gerçekler Anayasa, Kalkınma Planları, Hükümet Programları ve Yıllık Programlar'da Ormancılık", Ankara, Eylül 2001.

- [6] Dogan, C., 2011 Determination of grassland areas in Isparta province by using Geographic Information Systems, Master Thesis. Suleyman Demirel University, Isparta, Turkey
- [7] Babalik, A. A., 2008, Isparta Yöresi Meralarının Vejetasyon Yapısı ile Toprak Özellikleri ve Topoğrafik Faktörler Arasındaki İlişkiler, Süleyman Demirel Üniversitesi, FBE Doktora Tezi, Isparta.
- [8] Anonymous, 2013. Arazi İzleme Sistemi. Arazi Örtüsü İstatistik Verileri. Orman ve Su İşleri Bakanlığı.
- [9] Anonymous, 1994. Isparta İli Arazi Varlığı, TC. Başbakanlık Köy Hizmetleri Genel Müdürlüğü Yayınları, Rapor No: 32, Ankara.
- [10] Anonymous, 2001. Devlet Su İşleri XVIII. Bölge Müdürlüğü Etüd Raporları, Isparta.
- [11] Ucar Y., Yardımcı N., 2003. Isparta İli Sulama Şebekelerinin Sorunları ve Çözüm Önerileri. Süleyman Demirel Üniversitesi, Fen Bilimleri Enstitüsü Dergisi. 7(2): 30-35.
- [12] Anonymous 2004-2008. DSI'ce işletilen ve Devredilen Sulama Tesisleri Değerlendirme Raporları. DSI Genel Müdürlüğü, İşletme ve Bakım Dairesi Başkanlığı, Ankara.
- [13] Ucar Y., 2011. Performance Assessment Irrigation Schemes According to Comparative Indicators: A Case Study of Isparta, Turkey. European Journal of Scientific Research. 52 (1): 82-90.
- [14] Tueller P. T., 2001, Remote sensing of range production and utilization. Journal of Range Management 54: 77-89.
- [15] Bozkurt Y., Basayigit L., Kaya I., 2008, Determination of grazing pressure using RS techniques and monitoring the change in grassland status by GIS. 59th EAAP, Annual Congress, Vilnius, Lithuania.
- [16] Erdin K., Koc A. and Yener H., 2002, Remote Sensing Data İn Monitoring Of Relations Between Forest And Settlements Areas. 3rd International Symposium Remote Sensing of Urban Areas, Proceedings Volume II, 11-13 June 2002, Yuyap-İstanbul, Turkey, 600-608.
- [17] Taylor C.A. Jr., Garza N.E. Jr., Brooks T.D., 1993. Grazing systems on the Edwards Plateau of Texas: Are they worth the trouble, II. Rangelands, 15: 57-61.
- [18] Çakmak, B., Uçar, Y., Aküzüm, T., 2007. Water resources management, problems and solutions for Turkey. International Congress on River Basin Management 22-24, March 2007, Antalya, 867-880, Turkey.

OBTAINING OF PROTEIC BIOMASS BY CULTIVATION OF LACTIC ACID BACTERIA ON GRAPE MARC DIFFUSION SOLUTION

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Key words: grape marc, lactic bacteria, *Lactobacillus* sp., proteic biomass

Abstract

In this article are presented the researches made in order to obtain protein biomass with the aid of lactic bacteria grown on an economically medium, achieved by using secondary products from the winery: marc and wine yeast. Therefore, there were cultivated two strains of *Lactobacillus* sp. on five different growth medium. The protein biosynthesis and evolution of lactic fermentation were monitored by determining the optical density (OD) of the culture at a wavelength $\lambda = 600$ nm and by counting the colony forming units (CFU) by serial dilutions and seeding on plates and by determination of lactic acid obtained. The results showed that the fermentation medium represented by diffusion solution of the marc, enriched with peptone is economically profitable compared to other culture media containing peptone, yeast extract, glucose, minerals, amino acids and vitamins presented in the literature.

INTRODUCTION

Valorization of winery waste products has become an urgent need of the winemaking companies because of the high taxes of the waste disposal. This is why the recovery of by-products of the wine industry is extensively studied in the literature [1], in search of economically viable solutions for valorizing the production residues [2]. This could be also a process that might provide additional sources of income [3].

In the present study was investigated the possibility to obtain protein biomass with the aid of lactic bacteria grown on an economically medium, achieved by using secondary products from the winery industry, namely grape marc and wine yeast.

Lactic acid bacteria are widely used in industrial food fermentations and are receiving increased attention for use as cell factories [4].

Our research focused on the possibility of obtaining protein biomass with the aid of

lactic bacteria grown on different cultivation media achieved by exploiting both the solution of marc containing sugars [5] and mineral salts and also the proteic extract from wine yeast which brings the organic nitrogen source [6] and the growth factors.

MATERIALS AND METHODS

Two strains of lactic acid bacteria were subjected to study as follows: *Lactobacillus* sp. GM isolated from ruminal fluid of cattle and *Lactobacillus* sp. A₁. *Lactobacillus* sp. is a gram positive, microaerophilic bacteria.

The two strains of *Lactobacillus* sp. were grown statically at 40° C on 5 different culture media at pH 6.0.

We used grape marc originating from processed white wine and wine yeast (yeast sediment from fermentation of white and red wines). The grape marc was obtained from continuous press and was represented only by the skin and seeds, while the clusters were separated and discarded earlier in the

production process. The grape marc was collected immediately after pressing, so it was fresh, unfermented and originating from healthy grapes.

Both wine yeast and the grape marc were distributed immediately in plastic bags and deposited in a freezer at -12°C .

RESULTS AND DISCUSSIONS

The protein biosynthesis and the evolution of lactic fermentation were monitored by determining the optical density (OD) of the culture at a wavelength $\lambda = 600\text{ nm}$ and by counting the colony forming units (CFU) by serial dilutions and seeding on plates and by determination of lactic acid obtained, also (figure 1 -7).

There were obtained the growth curves of the two strains in parallel with the dynamics of the growth of lactic acid on the 5 different culturing media.

We have experienced the following working variants:

1. MRS - the standard medium (control);
2. Marc washing solution;
3. Marc washing solution with the addition of peptone 1 g% (corresponding to the concentration of the standard);
4. Marc solution mixed with yeast extract (3:1);
5. Marc solution mixed with yeast extract (1:1)

By analyzing the dynamics of accumulation of lactic acid and biomass formation in standard MRS medium compared with the proposed economic variations can be withdrawn that on the standard MRS medium the fermentations were conducted with *Lactobacillus sp. GM* and *Lactobacillus sp. A₁*.

Regardless of the microorganism used (Figure 1 and Figure 2), the evolution of biomass accumulation was typical for bacteria. It can be observed the logarithmic growth phase for 6 hours, followed by a slower phase of growth of approximately 2 hours, followed eventually by a stationary phase.

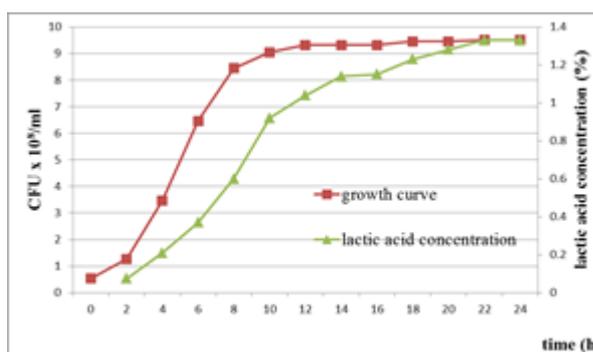


Figure 1. The profile of the growth curve and accumulation of lactic acid for strain *Lactobacillus sp. GM*, on MRS medium

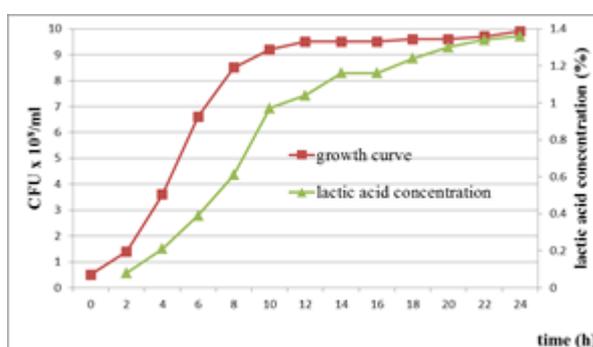


Figure 2. The profile of the growth curve and accumulation of lactic acid for strain *Lactobacillus sp. A₁*, on MRS medium

Lactic acid biosynthesis occurred at a slower pace at the beginning of fermentation, followed by an increase from the middle of the logarithmic phase and continued during the stationary phase of growth. Economically profitable media based on diffusion water of the grape marc, containing 3.6% glucose and 33.6% protein d.m. showed a differential evolution. Thus, the diffusion water of the marc used as it was, represents the control (Figure 3), and encouraging results have been obtained. This growing medium allowed the accumulation of biomass and lactic acid at mean values. The logarithmic growth phase was extended to 18 hours, observing a maximum accumulation of lactic acid by the end of fermentation.

On the medium from marc enriched with peptone solution, when used as biological material the *Lactobacillus sp. GM* strain (Figure 4), the biomass accumulation value was 7 times higher than the standard medium.

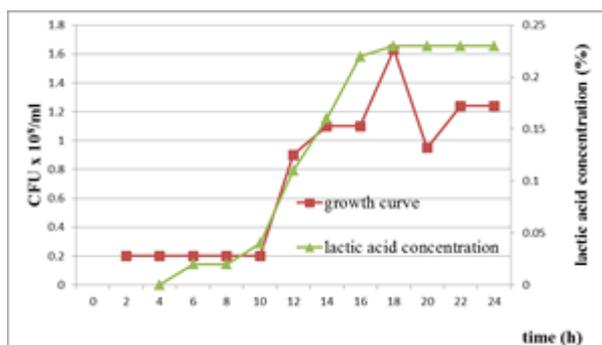


Figure 3. The profile of the growth curve and accumulation of lactic acid for *Lactobacillus sp.* strain GM, on marc washing solution

Logarithmic growth phase was extended to 18 hours, being observed a high accumulation of lactic acid by the end of fermentation period (22-24 hours).

On a medium with the same composition, using as seed material the transformed strain of *Lactobacillus sp. A₁*. (Figure 1), were obtained higher values than in the case of fermentation with the parent strain (Figure 4).

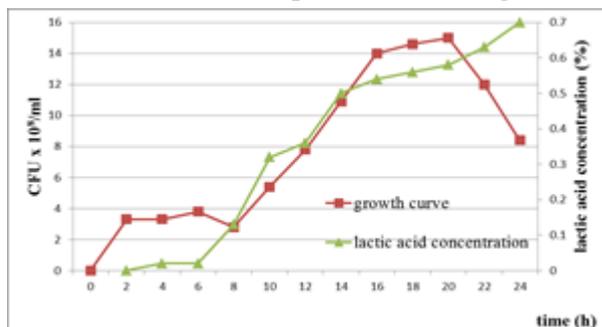


Figure 4. The profile of the growth curve and accumulation of lactic acid for *Lactobacillus sp. GM80* strain, on marc washing solution with the addition of 1 % peptone

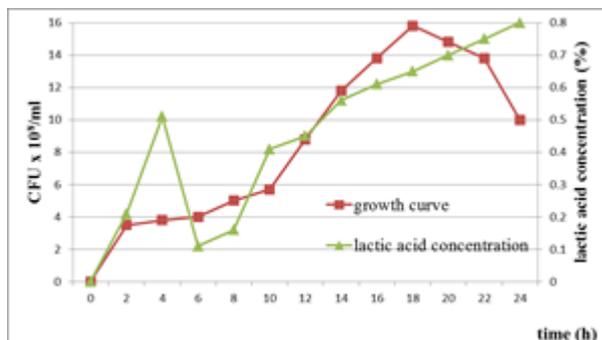


Figure 5. The profile of the growth curve and accumulation of lactic acid for strain *Lactobacillus sp. A₁*, on marc washing solution with the addition of 1 % peptone

By replacing the complex source of nitrogen peptone with yeast autolysis solution, (Figure

6 and 7), regardless of its concentration in the medium (3:1 and 1:1), did not provide the polypeptides necessary for the microorganisms growth. This was reflected in the decrease of the number of cells in the medium and the extension of the phase of logarithmic growth to 20 hours. The accumulation of lactic acid took place was gradually until the end of the fermentation process.

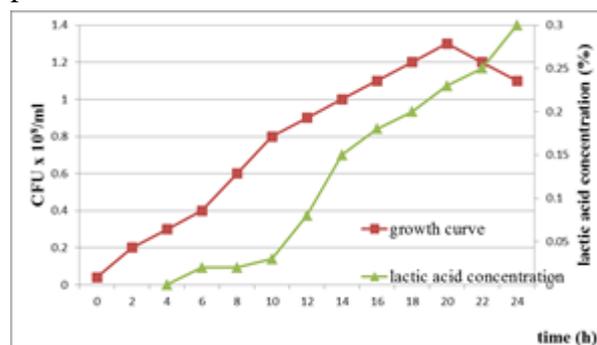


Figure 6. The profile of the growth curve and accumulation of lactic acid for strain *Lactobacillus sp. GM*, on medium from marc solution mixed with yeast extract (3:1)

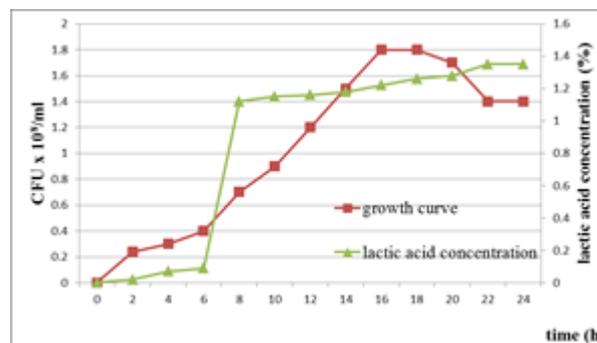


Figure 7. The profile of the growth curve and accumulation of lactic acid for strain *Lactobacillus sp. GM*, on medium from marc solution mixed with yeast extract (1:1)

CONCLUSIONS

By comparing the growth curves of the two strains, in parallel with the dynamics of the accumulation of lactic acid can be seen that the maximum biomass accumulation occurred in the medium originating from the marc solution supplemented with peptone, obtaining much better results than on the standard medium (MRS). By replacing the complex source of nitrogen peptone with yeast autolysis solution, (Figure 6 and 7),

regardless of its concentration in the medium (3:1 and 1:1), did not provide the polypeptides necessary for the microorganisms growth. This was reflected in the decrease of the number of cells in the medium and the extension of the phase of logarithmic growth. The results showed that the fermentation medium used in the experimental scheme, represented by diffusion solution of the grape marc, enriched with peptone is economically profitable compared to other culturing media containing peptone, yeast extract, glucose, minerals, amino acids and vitamins presented in the literature.

Rapid multiplication realized by both strains of lactic acid bacteria on the economic medium diffusion represented by the diffusion solution of the grape marc enriched with peptone allow the application of a continuous or semi-continuous fermentation technology, which would bring back a good efficiency of the bioprocess.

Biochem Biotechnol. 2009 Feb;152(2):p. 262-274.
doi: 10.1007/s12010-008-8252-x.

REFERENCES

- [1] Butu Alina, Butu M., Rodino Steliana, 2011, Studies on the possibility to recover the by-products resulted from the vinification process, Banat's Journal of Biotechnology, ISSN 2068-4673 (Print), ISSN 2068-4738 (CDROM), vol 3, 56-63;
- [2] Rodino Steliana, Butu M., Golea Diana, Butu Alina, 2011, Qualitative evaluation of fresh marc - raw material with valuable composition, Banat's Journal of Biotechnology, ISSN 2068-4673 (Print), ISSN 2068-4738 (CDROM), vol 4, 18-27;
- [3] Devesa-Rey R., Vecino X., Varela-Alende J.L., Barral M.T., Cruz J.M., Moldes A.B., 2011, Valorization of winery waste vs. the costs of not recycling. Waste Management, Volume 31, Issue 11, P. 2327-2335;
- [4] Willem M de Vos, Hugenholtz Jeroen, 2004, Engineering metabolic highways in Lactococci and other lactic acid bacteria, Trends in Biotechnology, Volume 22, Issue 2, p. 72-79;
- [5] Iacumin L, Manzano M, Cecchini F, Orlic S, Zironi R, Comi G., 2012, Influence of specific fermentation conditions on natural microflora of pomace in "Grappa" production. World J Microbiol Biotechnol. 2012 Apr;28(4):p. 1747-1759. doi: 10.1007/s11274-011-0989-7. Epub 2011 Dec 25;
- [6] Rivera, O.M, Torrado, A.M, Moldes, A.B, Domínguez, J.M., 2009, Minerals and organic nitrogen present in grape marc hydrolyzates enhance xylose consumption by *Lactobacillus pentosus*. Appl

THE EVOLUTION OF FRUIT AND VEGETABLE SECTOR IN ROMANIA, IN THE CURRENT ECONOMIC CRISIS

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Abstract

This paper is a study that has as main objective the diagnosis of fruits and vegetables sector in Romania and identifies realistic and feasible measures and actions to reduce the negative effects of the financial crisis, manifested in this sector. This paper is structured in two parts. The first part of the paper is intended to describe fruit and vegetable chain, being a detailed analysis of the current situation of fruits and vegetables sector in Romania, showing the effects of the crisis in this sector. The second part proposes a series of realistic and feasible measures and actions for risk reduction and recovery in the sector affected by the manifestation of the economic crisis.

Key words: agro-food chain, crisis, efficienc, fruits and vegetable sector, risk

INTRODUCTION

The importance of the subject lies in the very importance of the horticultural sector, providing heavy-duty products for consumption, due to their sensory characteristics and essential nutrients they contain. It is also important to look at this sector for better exploitation of the potential of Romania to ensure these products internal, in order to increase the contribution to GDP and to increase farmers' incomes while reducing the share of imports of fruit and vegetables.

This research paper addresses the issue of reducing the effects of the financial crisis on fruit and vegetable chain into three evolutionary stages, structured in two parts of the study: the first part analyzes in detail the fruit and vegetable sector in Romania and identifies the main negative effects of the financial crisis that impacted on sector growth, and the last part contains a number of conclusions drawn from the study and proposals to overcome the crisis effects and improve overall performance within the sector.

MATERIALS AND METHODS

The methodology of this research involved a documentary synthesis, analysis and interpretation of statistical data collected from Tempo on line database [2], EUROSTAT [1] and FAOSTAT [5], and implementing a set of conclusions and suggestions for improvement based on the analysis performed.

RESULTS AND DISCUSSIONS

1. Analysis of current situation of fruits and vegetables sector in Romania

Within agriculture, horticulture is one of the most intensive sectors and its increased level is based on the extent of the culture change system, species and varieties, as well as increasing the size of additional investment in this area. This process of intensification of horticultural production concern one or more species, depending on the use of more productive varieties and higher quality for optimal use of doses of fertilizers and pesticides, their use in compliance with all agro-technical rules on vegetable crops and fruits.

This feature specific to orchards and vegetables, as a branch of high intensity,

producer of food required for consumption and substantial gainful for those who practice in accordance with the practice of proper and efficient management and marketing, has boosted its expansion in countries with high agricultural potential and have the appropriate climatic conditions, as is the case of Romania. Vegetables and fruits are foods of plant origin with an important role in the diet, because of their sensory characteristics and precious nutrients they contain, in the form of carbohydrates, vitamins, organic acids, mineral salts, etc. If in the past they were consumed more for a survival instinct, now food science considers fruit and vegetables as a means to improve food, an indispensable asset in producing a balanced rations due to the wealth of nutrients and their beneficial role they have on the normal body functions and maintaining health.

The present situation of fruit and vegetable sector in Romania is a critical, first because of the effects of the financial crisis and second because of the high level of imports. Statistics show that the market supply of vegetables and fruits in Romania is made at a rate of about 70% of imported products. This percentage is quite high also because Romania is a net importer of exotic fruits, which are not produced domestically.

In order to rightly diagnose the current situation of fruits and vegetables sector in Romania, it is necessary to analyze the key indicators of the industry.

2. Area planted with vegetables and fruit trees

Next, it is analyzed the evolution of area planted with vegetables and fruit trees in our country.

The analysis of the data presented in Table 1 and Figure 1 shows a number of findings. In the period under review, the largest area planted with vegetables was recorded in 2006. The evolution of areas planted with vegetables showed an oscillating trend, marking the lowest level in 2007.

In 2008 -2010, the overall evolution of areas planted with vegetables had significant variations, marking a pronounced downward trend.

Table 1. Area planted with vegetables and fruit trees 2005-2011(thousands ha)

	2005	2006	2007	2008	2009	2010	2011
Total vegetables :	266,7	280,1	250,0	268,1	266,1	262,2	263,4
Tomatoes	46,4	49,9	45,9	51,4	48,9	49,7	51,8
Onion	35,4	33,6	33,9	34,8	35,1	33,7	33,1
Garlic	12,4	13,0	11,4	13,7	13,1	12,8	12,1
Cabbage	54,6	45,7	46,5	49,2	48,4	47,2	46,9
Pepper	19,0	23,0	18,6	20,2	20,0	21,0	20,0
Fruit trees**	218,2	213,4	215,8	207,3	205,2	198,6	196,1

Source: FAOSTAT, National Statistics Institute, Eurostat

The graphical illustration of the data presented in Table 1 is shown in Figure 1

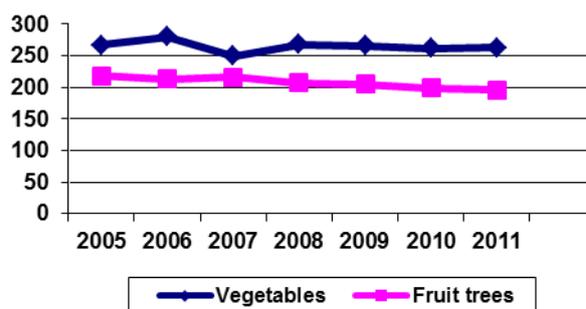


Fig. 1 Areas planted with vegetables and fruit trees

This may be due to the impact of economic - financial crisis, which had negative effects on our country in all economic fields. The crisis contributed to lower incomes for the farmers, which resulted in lower financial power to establish crops in 2009 and especially in 2010. 2011 is a year of recovery from this point of view, areas cultivated with vegetables posting positive developments over the previous year.

It is also noted that the largest share in the total area cultivated with vegetables is own by tomatoes, reaching a rate of 19.6% of the total in 2011.

In contrast, the lowest share is garlic, which owns approximately 2.8% of the total area cultivated with vegetables.

In terms of area occupied by trees, its evolution has significant variations. It is noted, however, a sharp downward trend of fruit trees, after 2007, reaching to 90.8% in 2011 compared to 2007. This phenomenon

can be explained by the lack of financial funds necessary for maintaining orchards, because of the manifestation of the economic crisis during 2008 to 2011.

3. Fruits and vegetables production

Next, we analyze the production of vegetables and fruits obtained in Romania from 2005 to 2011. The data are presented in Table 2.

Table 2. Fruits and vegetables production during 2005 – 2011 (thousands tonnes)

	2005	2006	2007	2008	2009	2010	2011
Total vegetables :	3624,8	4143,3	3118,4	3820,9	3902,4	3866,9	4176,3
Tomatoes	626,9	834,9	640,7	814,3	755,5	768,5	911,0
Onion	363,6	390,6	324,9	395,5	378,1	369,1	394,3
Garlic	68,3	64,2	49,9	72,3	63,2	67,2	66,6
Cabbage	1011,6	899,2	967,6	1004,1	983,6	981,2	1025,3
Pepper	203,8	279,1	184,9	238,7	245,7	243,5	253,5
Fruit trees	1647,0	1486,4	1085,8	1179,2	1323,0	1419,6	1479,9

Source : FAOSTAT, National Statistics Institute

The graphical representation of data from Table 2 is shown in Figure 2.

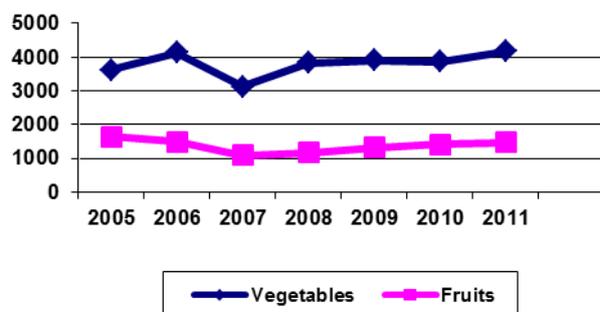


Fig. 2 Vegetables and fruits production

The analysis of data presented in Table 2 and Figure 2 shows a number of findings. Vegetable production had between 2005 to 2011 an oscillating evolution, having maximum value in 2011. At the opposite end is 2007, when output reached its lowest share of the period.

Between 2008 to 2010 there were significant variations, although production has not reached the volume recorded before the crisis (in 2006). Therefore, this crisis resulted in reduced production of vegetables, due to the lack of funds for making timely tillage necessary, especially for small farms with lack

of financial capital. It is also noted that in the structure of vegetable production, the largest share is held by tomatoes, with approximately 27.8% of the total. This is justified, on the one hand by the fact that tomatoes have the highest share in the total area cultivated with vegetables (Table 1) and on the other hand, because is a type of intensive culture. In contrast, the lowest culture is garlic, which has the lowest share in the structure of production of vegetables (about 1.3%) of the total; In terms of fruit production obtained during 2005 - 2011 there is an oscillating trend with decreasing values during 2005 - 2007 and increasing at a relatively slow trend from 2008 to 2011.

4. Fruits and vegetables consumption in Romania

For a relevant analysis of fruit and vegetable sector, it is necessary to correlate the production with the consumption of these products.

Table 3 presents the evolution of average consumption/capita of fruit and vegetable consumption in Romania and the calculation of the total consumption.

Table 3. Fruits and vegetables consumption in Romania

Indicator	2005	2006	2007	2008	2009	2010	2011
Average consumption of vegetables (kg/inhabitant)	162,6	181,7	164,1	176,0	168,2	174,4	181,0
Average consumption of fruits (kg/inhabitant)	75,9	83,2	67,8	66,7	62,3	63,3	70,5
Total population (millions)	21,6	21,5	21,5	21,5	21,4	21,4	21,3
Total consumption of vegetables (thousands tonnes)*	3512,1	3906,5	3528,1	3784,0	3599,4	3732,1	3855,3
Total consumption of fruits (thousands tonnes)	1639,4	1788,8	1457,7	1434,0	1333,2	1354,6	1501,6

Source: National Statistics Institute; Own calculations

From the data analysis presented in the table, it can be made a number of findings. The average consumption of vegetables / capita registered a fluctuating trend during the period under review, registering the lowest value in 2005. Also, it can be seen that during 2007 - 2009 vegetable consumption showed lower values than in the years preceding the crisis (2006), which means that the negative

effects of the crisis were felt in the consumer segment.

Average consumption of fruit / capita registered a fluctuating trend during the period under review, with the highest value in 2006. During 2007 - 2010, the average consumption of fruits showed a downward trend from 2006, the period of recovery being manifested in 2011, when fruit growth rate is significant compared to previous years. Next, it will examine in Figures 3 and 4 the evolution of fruit and vegetables fruit and vegetable consumption trends to highlight the coverage of demand from domestic production between 2005 to 2011.

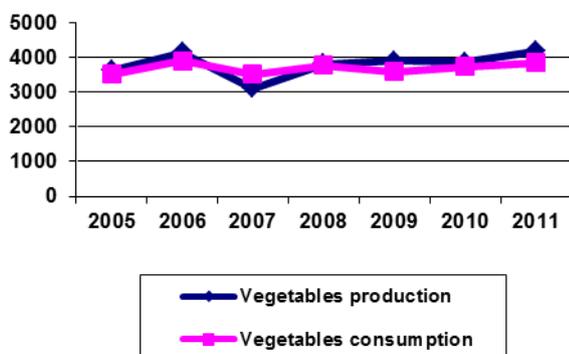


Fig. 3 Comparative analysis of vegetables production and consumption

Through the analysis presented graphically in Figure 3 it can be concluded that, with the exception of 2007, in the entire period, the domestic production of vegetables could sustain consumption. However, there is a relatively high share of imports of vegetables, which is caused, on the one hand by seasonality, and on the other side of the barriers of small producers to in large retail chains, which mainly have supply contracts with foreign producers.

Economic-financial crisis deepened further this imbalance, which is disadvantageous for both local producers (who can not sell all the production in the market) and consumers (who are forced to purchase poor quality products or at disadvantageous prices).

Unlike vegetables, fruit consumption has exceeded almost each of the years analyzed the domestic level. This is the effect of the marketing of exotic fruit category, which can only be purchased from imports.

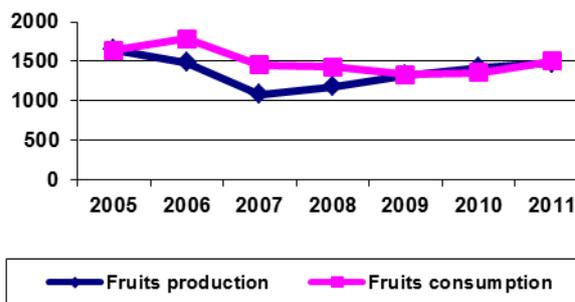


Fig. 4 Comparative analysis of fruits production and consumption

Nevertheless, we believe that it should be stimulated the domestic consumption of fruits, as it ensures a higher proportion of necessary vitamins and nutritional and sensory qualities higher due to freshness. Also, the fruits from local production can be traced throughout the chain.

CONCLUSIONS

Romania has a great potential for the production of vegetables, mainly due to high natural fertility of soils and climate diversity. Besides climatic conditions favorable for fruit and vegetables Romania still lacks agriculture technical requirements and features characteristic of a developed economy.

The data provided by National Statistics Institute show that both vegetable and fruit farms predominate with an average area of 3 ha. The situation is quite critical when have to consider that over 90% of these are managed by individuals who can not effectively manage the emerging risks, particularly in crisis. This explains the low level of technology holdings, training of farmers, organization of production and large quantities of fruits and vegetables sold at farm gate or street trading networks, also because there are barriers to input in major retail chains, which thus protects its external suppliers.

The production potential of the sector is affected for the following reasons:

- large number of small farms;
- low level of endowment of holdings with modern technical equipments of production and harvest;

- decreasing the area planted with vegetables and fruit trees and bushes;
- high degree of fragmentation of vegetables and fruit surfaces and the lack of a coherent land consolidation;
- low level of rejuvenation of orchards associated with large areas of old orchards;
- large areas of protected areas abandoned and / or built based on outdated techniques;
- increased frequency of extreme weather events with high impact on production;
- lack of management and marketing knowledge to assess and counter the economic risks, especially in the current crisis.

Also, as risk factors amplified by the crisis in fruit and vegetables sector may be mentioned:

- extreme weather events and various diseases and pests;
- imports from European and Asian countries mainly affecting fruit and vegetable market;
- various media articles that send incomplete and incorrect information about the importance of fruit and vegetables.

Most times, the processing industry was the main outlet for absorbing excess production, due to lack of vertical integration of the sector by establishing permanent contractual relations between producers and processors. Hence it may be inferred that fresh produce chain is more vulnerable to risk factors, regardless of nature, rather than processing industry.

Given the small size of the fruit and vegetable farms and farmers lack of experience in relation to harvest insurance system against risk prevention mechanisms and risk management plays a very important role in decreasing the producers' incomes. Given the small number of farmers who conclude insurance policies of fruit or vegetables, we can say that the adverse effects of vegetables and fruit plantations of climate phenomena and diseases, and pests, or even not-selling risk as a result of decrease in purchasing power of people (such as the current crisis) are all borne by producers. The number of holdings which provides crop is very low in these conditions for fruit and vegetable sector and it can not speak of a

system of crop insurance. The causes are many but the most important deficiencies are:

- Lack of interest from producers;
- Lack of attractive offers / flexible by insurance companies;
- Lack of collective approaches;
- Lack of concern by the government to create a guarantee fund involving the state, insurance companies and manufacturers.

There are some large companies that produce about 40% of the national production of vegetables and about 25% of fruit production. But most of the production of vegetables and fruits in the country is done by small producers, who own and cultivate areas between 0.3 to 2 ha per farm. Their products are offered on the open market street in urban areas. Usually small manufacturers limit their production to sales capacity, because production costs are high and incomes are decreasing every year.

Another factor that reduces income and therefore the production of small and medium enterprises has been the emergence of intermediaries who created the "gray market." They buy products under production cost, which make harder the activity of producers, especially in crisis situations when consumption is lower.

In this context, the reorganization of production-marketing system of fruits and vegetables for the efficient use of pedo-climatic conditions available to Romania, while improving the socio-economic and rural areas and appropriate professional managing risk to overcome crisis, is a priority for recovery and future development of the sector.

It is necessary to establish measures to improve the production and recovery the local fruits and vegetables sector. Given the very high production potential, tradition, quality of soil, climate, plasticity species and varieties of fruit trees, vegetable species, labor and sales market, we can say that there are optimum conditions so as to be able to ensure the supply of the population with about 80% of consumption. This can be supplemented with imports during the extra-season, and

obviously with exotic fruits (citrus, bananas). These coherent and pragmatic measures proposed should focus on the following priority actions to reduce risks of any kind in the crisis:

1. Increased competitiveness: given the low level of knowledge of marketing, product competitiveness can be ensured through training programs, promotion of applied research and optimizing production costs. Also, investment is needed in technology that lead to the creation of added value of fruit and vegetables, concentrating supply and marketing networks infrastructure improvements.

2. Reduce production costs, stabilize producer prices, production planning and supply: given concentrating tend to offer fruits and vegetables at Community level is important for producers to plan and better adapt the supply to market demand (product quality, quantity, regularity and short delivery terms, the principles of traceability). Increasing the number of producer organizations and the degree of professionalism of the staff can determine indirectly increase of producers' incomes. Also, professional agreements can play an important role in balancing supply and demand in the market with positive effects. From here we can deduce the need to stimulate the development of inter-professional organizations as partners in shaping market policy. If inter-branch organizations are able to engage in solving technical and technological problems of producers through a partnership with networks of research, development and innovation of universities, they can stimulate the growing importance of applied research and the degree of innovativeness of farmers.

3. Promoting products: to encourage the sale of fruit and vegetables should be a structured approach to promotion. Promotion of fruit and vegetables has a long term impact on consumption and is one of the most important measures that should be taken by producers.

4. Prevention and crisis management: vegetables and fruits are sensitive to fluctuations in market prices. Thus it is important to prevent and combat market

crises. Therefore it would be desirable for producer organizations:

-to stimulate by promoting further dissolution;
-to organize their qualifications, for example in quality systems, marketing, stimulating selling, etc.

-making crop insurance for its members.

5. Increased production potential: it can be done by increasing the high technology level and market orientation of farms.

REFERENCES

- [1]EUROSTAT, www.eurostat.ec.europa.eu;
- [2]Institutul National de Statistica, 2012, Anuarul Statistic al Romaniei;
- [3]Manole, V., Boboc, D., 2005, Filiere agroalimentare, ASE, Bucharest;
- [4] Manole, V., Stoian, Mirela, 2004, Marketing, ASE, Bucharest;
- [5] Organizatia Natiunilor Unite pentru Agricultura si Alimentatie, www.faostat.org
- [6]Programul National de Dezvoltare Rurala, www.pndr.ro
- [7]Strategia nationala pentru programele operationale in sectorul de fructe si legume.

QUANTITATIVE ANALYSIS OF RURAL WORKFORCE RESOURCES IN ROMANIA

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Abstract

This paper is proposed like an analysis of labor resources in Romania, especially for the agricultural sector workforce. Economic growth and development are overarching objectives of the national economy, closely related to the resources used. The main resource is the labor factor. Since the man with his labor, is the most valuable renewable resource and virtually unlimited, its use in the most efficient and offered domestic and foreign, and the evolution of prices and incomes, but also through more fully may have been and remain a constant concern of all stakeholders, finding the most appropriate way to fight unemployment is an objective necessity. The variety and complexity of the phenomenon, its forms of manifestation of multiple implications, directly or indirectly in almost all parts of the body economic and social - are particularly difficult the task. Creating conditions for labor factor to be active and creative is one of the major socio-economic problems facing all countries of the contemporary world.

Key words: agriculture, employment, labor resources, population, rural

INTRODUCTION

The labor market in broad sense, include employment problems, unemployment and quality of work, productivity, earnings and labor costs. The employment - in the broadest sense of the term - is the only mechanism for ensuring security and social protection for people facing temporary difficulties by creating resources to support social protection. The resources that produce the highest desired profit are not financial or business machines - are people who use these resources and produce goods, offering added value to these resources. Man is located in the center of any research on the development and evolution of the economic system. In this respect, an approach to employment and to unemployment is a research priority. According to this, the primary objective is to create more jobs and ensure better living conditions. This strategy aims to ensure smart, sustainable and inclusive growth [1].

Given the many changes who register under the impact of labor market transition in Romania, we consider that the problem of

employment and unemployment are of special importance and should be addressed.

MATERIALS AND METHODS

In this paper, during the analysis will be used more elements and concepts characteristic of the labor market and thus are recommended domain-specific methodological notes as follows in this section [6].

Civil employment includes, according to the methodology used for the labour force balance, all persons who, during the reference year, carried out a socio-economic lucrative activity, excepting military staff and similar, political and community organisations employees and the convicts.

Economically active population (*active persons*) comprises all persons aged 15 years and over, providing available labour force for the production of goods and services; it includes employed population and ILO unemployed.

Employment includes, according to the methodology of "Household labour force survey" all persons aged 15 years and over, who carried out an economic activity

producing goods or services of at least one hour¹) during the reference period (one week) in order to get income as salaries, payment in kind or other benefits.

Status in employment represents the situation of an employed person, depending on the way of achieving income from his activity, namely:

– *employee*, a person who carries out his activity based on an employment contract into an economic or social unit - no matter of its ownership type - or for private persons, for a remuneration as salary, in cash or in kind, as commission a.s.o.;

– *employer*, a person who carries out his occupation (trade) in his own unit (enterprise, agency, workshop, shop, office, farm a.s.o.) for whose activity he has one or several employees;

– *self-employed*, a person who carries out his activity in his own unit or in an individual business, without hiring any employee, being helped, or not, by contributing family workers;

– *contributing family worker*, a person who carries out his activity into a family economic unit, run by a member of the family or a relative, for which he gets no remuneration as salary or payment in kind; peasant (agricultural) household is considered such a unit;

– *member of an agricultural holding or of a non-agricultural co-operative*, a person who worked either as owner of agricultural land into an agricultural holding set up according to legal provisions, or as a member of a craftsmen, consumption or credit co-operative.

ILO unemployed, according to International Labour Office (ILO) criteria, are persons aged 15-74 years who, during the reference period, simultaneously meet the following conditions:

– have no job and are not carrying out any activity in order to get income;

– are looking for a job, undertaking certain actions during the last four weeks (registering at employment agencies, or private agencies for placement, attempts for starting an activity on own account,

publishing notices, asking for a job among friends, relatives, mates, trade unions a.s.o.); – are available to start work within the next two weeks, if they immediately find a job.

Registered unemployed represent persons who fulfil the cumulative conditions stipulated by the Law no.76/2002 regarding the system of unemployment insurance and employment incentives and who register to the employment agency in the territorial zone they have domicile or, by case, residence, or to another provider of employment services, functioning according to the law, in order to get a job [8].

In the analysis performed in this work we use statistics from Tempo-online data base for the period 1996-2012 – National Institute of Statistics [10].

RESULTS AND DISCUSSIONS

In Romania, earlier than it would be assumed by its economic development, there has been recorded the problem of aging population. Referring to a relatively short historical period, such as the past two decades, 1990-2010, in Romania's case is remarkable, the demographic transition from a structure characteristic of a country with a relatively young population and growing at one characteristic of a country with affected by the aging of the population and therefore located in a significant process in reduction [4].

In the modern economy, labor mobility is one of the basic conditions of development. It is dictated by the criterion of efficiency, workforce turning to more productive sectors or geographical areas, which clearly and wages, incomes are generally higher. Mobility is however restricted by the degree of labor market flexibility, as well as a number of other particular conditions. According to economic theory and practice, capital, tending to migrate to more profitable sectors and regions, entails a workforce which in time will gain increased.

The main contribution to the increase of aging population by 1990 had external migration, given that prevailed among active emigrants, both economically and demographically [5].

This contributed to the reduction of births and natural population growth. According to available data, between 1990 and 2010 the share of young population between 0 and 19, has dropped dramatically, from 31.7% in 1990 to 25.7% in 2000 to 20.8% in 2010, while share of elderly population over 64 years increased from 10.4% in 1990 to 13.3% in 2000 to 14.9% in 2010. In the same period, the share of the working population between 20 and 64 years increased from 57.9% in 1990 to 61.0% in 2000 to 64.3% in 2010. Stable population on 1 January (figure 1) is the population consists of people who live in those areas, with residence in the village at the time. It is calculated based on the last census, corrected by the natural increase of population, external migration, migration balance with relocation movement and the movement of migratory balance with changing residence between censuses and recorded phenomena given moment.

$PS(t) = PL(t) \pm$ balance announcement of residence (floating),

where:

$PS(t)$ = stable population

$PL(t)$ = resident population

t = time t

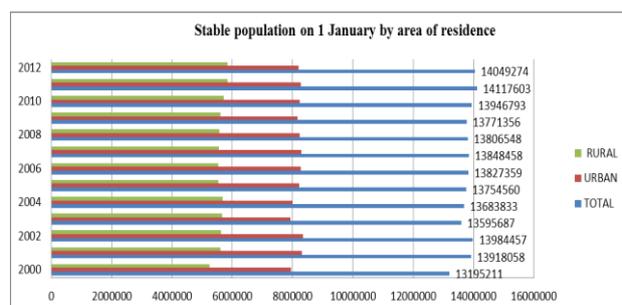


Fig. 1. Distribution of stable population on 1 January by area of residence

Analysing the phenomenon in residential work shows that activity rates are higher in rural than urban areas due to their historical, economic, social and even demographics. Urban-rural migration intensity increases with the approach end of life active people. After the age of 55 years, mobility decreases in intensity as the eve of retirement, the person's ability to seek a job or change their professional profile is very small [7]. In

conclusion, changes in respect of domestic migration flows as the main cause subsistence. There are numerous other disturbances on the labor market in Romania. Some are oldest being amplified during the crisis, others were yielded. The new labor code, which introduces some provisions aimed at labor market flexibility, seems not caused major effects, at least during the crisis. Causes disorders appear to be more complex, given the behavior of economic conservatism came from some traditions renounced hardly. The rapid adoption of modern methods and techniques of market regulation work, the determination of their application etc.

In a broad sense, labor market dysfunctions based on labor demand and supply mismatch. Different structure at some point between the two branches of equilibrium structure creates tensions in the labor market, eventually leading to inefficiency, either in use or in that labor capital. The main consequence of dysfunction in the labor market is the unemployment. The problem is more complex, it is just a result of imbalances [3].

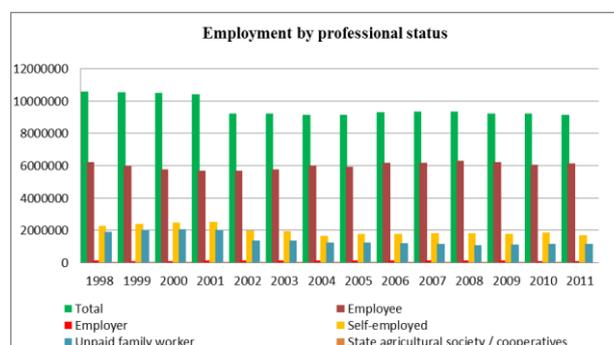


Fig. 2. Distribution of employed population by employment status

In Romania, as distinct from the situation in other EU countries, there is a major consequence of dysfunction in the labor market, namely the existence in the countryside (here I refer to the agricultural sector) of a large number of people having status of self-employed and unpaid family workers respectively. In reality, they are only partially employed or informal (Proofs are very low income that are officially registered near or below the poverty line) and not adapted or movable relative to current

conditions in the labor market in Romania, should be practically excluded from the labor force and eventually put into a special category of "unemployment" or whatever the "vacancy" (figure 2). However, through their professional status assigned to them formally and legally not entitled to unemployment benefits, however, are conventionally employed in the statistical system employed population category. In Romania, the rate participation and employment rates vary by area of residence and sex. Based on data published by the National Institute of Statistics (for the period 2000-2010) is found permanence decreasing trend both public participation in force employment and the employment rate, a phenomenon linked to the evolving economic-social in Romania, but also of the international. The decrease in absolute numbers was of 1.318 million people for the working population of 1.268 million people respectively for employment, mainly due to the reduction of public participation women in economic activities. However, there is significant reduction the active and employed population in rural areas compared to urban areas.

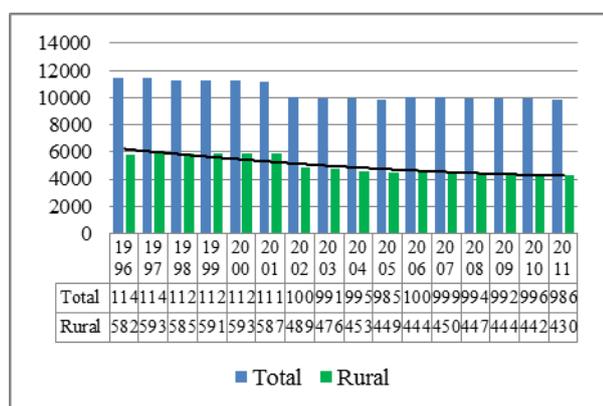


Fig. 3. Distribution of active population (thousand person)

Analysing participation rates by age group for the period up to 2010, the maximum was recorded in 1997, both for the entire population over 14 years (66.2%) and the population group 20-64 years (77.7%), while the small rate of non-relevant (33.8% and 22.3%). For the other two age groups considered, 15-19 years and over 64 years

respectively, the maximum turnout was recorded in 1992 (36.7%) and in 1999 (39.7%), simultaneously with minimum rates corresponding to inactivity (63.3% in 1992 and 60.3% respectively, in 1999). It also notes that, since 2002, when it recorded a sharp drop in participation rates and a jump in the course of inactivity, coinciding with the change of base data (i.e. from 2002 onwards the data has been changed due to adjustments required by consideration of population census). After this year, it appears, until the year 2010, relative flattening process for all age groups considered.

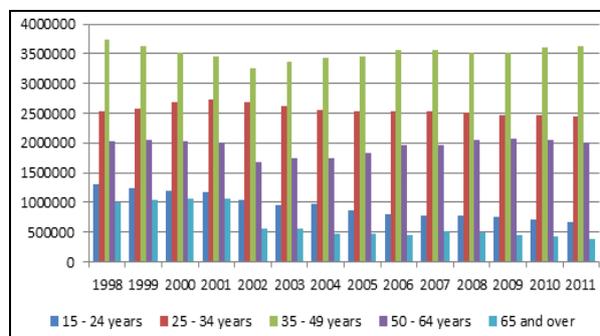


Fig. 4. Distribution of employed population by age

Employment is central to the workforce or the workforce, the other component being represented by the unemployed. Employment covers all persons from the age of 15, who conducted an economic activity producing goods or services (for at least one hour) in the reference period (one week) in order to get income as salaries, payment in kind or other benefits [9].

For two intervals within which data are comparable, there is a decrease of 3.5% in 1997-2001, after which up to the year 2010 a slight increase (+0.8%). From the analysis of the dynamics of the employment rate for people aged 20-64 who are interested in the Europe 2020 Strategy target, there is a decrease of 3.2% in the first period and almost stagnant in the second.

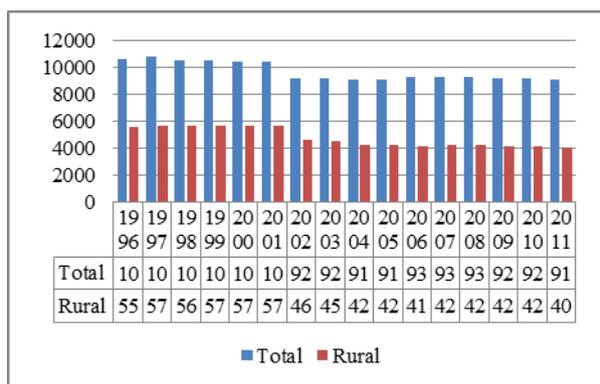


Fig. 5. Distribution of employed population (thousand person)

Note that increasing the employment rate when considering the whole population between 15 and 64 years, from 2002 to 2010, is achieved while decreasing by 470 thousand population aged 15 to 19 years (-28.2 %) and consequently, a significant reduction in its share in the total population aged 15 to 64 years, from 11.0% to 8.0% .

It notes the high percentage of elderly labor for agriculture, where more than 45 years represent more than 50% of the total (compared to 36.7% nationally) and people over 64 years almost 15% (compared to 4.5% national average). Practically the entire employed population over 64 years (98.3%) engaged in agriculture.

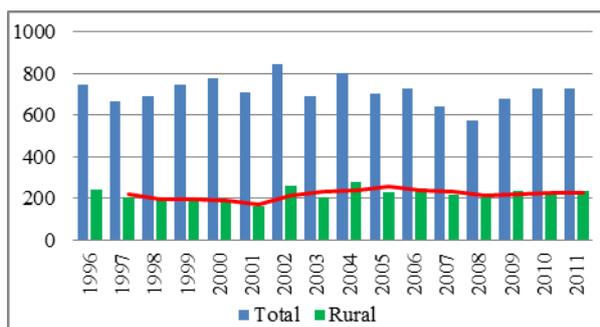


Fig. 6. Distribution of unemployed BIM (thousand person)

In the period 1996-2011, the dynamic of ILO unemployment rate in Romania ranges from a minimum of 5.8% (in 2008) and a maximum of 8.4% in 2002. On area of residence, the unemployment rate was higher in the population of urban areas (8.9% in 2002, 9.0% in 2004 and 7.9% in 2010), and by gender, it was higher in the male population

(11.2% in 2003 and 9.1% in 2010). The rural unemployment rate was the lower (4.7%) in 2008 and the level (7.7%) in 2002.

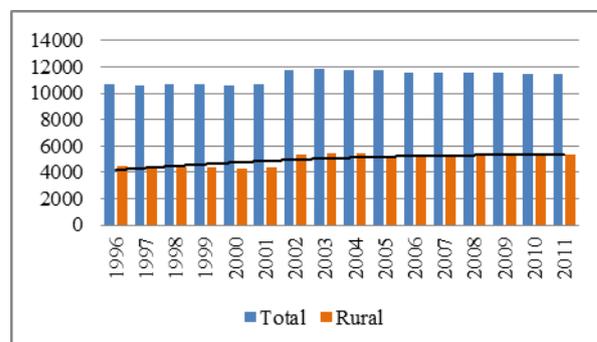


Fig. 7. Distribution of inactive population (thousand person)

The fact that throughout the transition, and after joining the EU, not managed in a satisfactory transfer to other branches of labor rural currently has adverse consequences. While currently in agriculture is occupied almost 30% of the workforce at the end of 2011, share in total number of employees was only 2%. This is consequence of the fact that in Romania, the agricultural structure of employment by profession is completely different from that of other branches of economy [1].

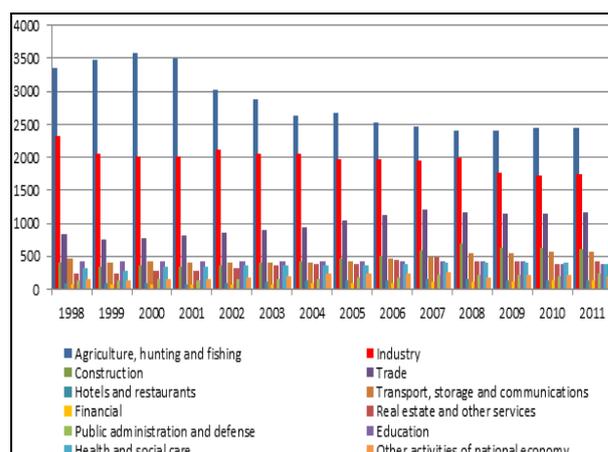


Fig. 8. Distribution of employed population by activity of national economy (CAEN section level)

Indeed, one can say that the population is employed in agriculture aging, the proportion of persons aged over 54 in employment in this branch of 33.6% in 2010. At the same time, the proportion constituted 27.9% of the young workforce under 35 years, as known, having a

low level of education and qualification, so weak possibilities adapting to market requirements will not have any hope of future migration to other activities are virtually captive. In fact, the whole industry, productivity a person is only about a quarter of the national average.

The result is that a large part of the rural population made a living income limit decent. Without investment to provide alternative employment in rural living and better conditions for civilized living situation will certainly worsen in the future [2].

CONCLUSIONS

From graphic representations based on the data (from Tempo on line data base from 1996 to 2012, National Institute of Statistics) and after analysis it appears that in terms of the changes taking place in the labour market can enter the following:

-In terms of quantity, the largest decline recorded in the age range 15-24 years. On the one hand it can be seen that a segment of the population that further education, but in the second segment 25-34 there is a possibility that they are no longer found in future national economy as a result of migration flows.

-The fastest growing segment is the segment aged 35-49 years. People aged around 40 are professional, mature, may have a significant contribution to economic progress. Considering that were present in the field of labor during transition exhibit great mobility and sustainable development can be the mainstay of the economy.

-Segment of those aged 50-64 years has increased and become a driver of tensions on the labor market. At this age, mobility decreases, and those dismissed comes a sense of discouragement and marginalization.

-Currently, in Romania, only 33.9% of total employment in rural areas working in non-agricultural. It is also known that in the case of agricultural labor during the calendar year is only partially occupied, and the self-employed occupations predominate (52.1%) and unpaid family workers (41.6%) actually

which means so-called practicing subsistence agriculture.

-Since 1990 reducing the number of employees in the economy was recorded in all sectors. In agriculture decreased number of trained annually, a rate of 32300 people each year, reaching in 2008 in agriculture there were only 15.4% of those who were active in 1990.

-Personnel cuts in the first two sectors were offset by increasing the number of employees in the tertiary sector. Regarding the intensity of urban migration - rural it increases with close people end their working lives. Changes to the meaning of internal migration flows are the main cause subsistence.

REFERENCES

- [1]Balaceanu Cristina, 2013, Logical Premises of the Mechanism between Sustainable Development and Human Development, Metalurgia International, ISSN: 1582-2214, Vol. XVIII, nr. 1, pp. 95-100, Thomson Scientific Master Journal List, letter M, position 400, www.isinet.com, position <http://scientific.thomson.com/cgi-bin/jrnlst/jlresults.cgi>
- [2]Balaceanu Cristina, Bemtoiu Claudi, 2008 Analysis of the standard of living and quality of life in post-accession Romania, pp. 505-513, in statistics, scientific disciplines and research methods in various fields, Economic Publishing House, Bucharest, ISBN: 978 - 973-709-336-3
- [3]Nica Elvira, 2008, employment strategies and policies of the labor force in Romania, Economic Publishing House
- [4]Oprescu George, 2001, Labor market. Theories, policies, transition in Romania, Publishing Expert
- [5]Vasile Valentina, Labor migration and sustainable development of Romania - theoretical and methodological approaches. System of indicators and analysis models, Publishing Expert
- [6]National Institute for Statistics, Statistical Household Labour Force Survey for data on employment and ILO Unemployment (defined According to the International Labour Office criteria)
- [7] <http://www.anofm.ro>
- [8] <http://www.dreptonline.ro/legislatie>
- [9]<http://www.insse.ro/cms/files/Statisticalyearbook/labormarket.ro.pdf>
- [10]NIS - Statistical Databases - Tempo-Online time series: <https://statistici.insse.ro>.

IMPACT OF THE PRINCIPLES OF FINANCIAL ACCOUNTING ON THE MANAGEMENT ACCOUNTING

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Abstract

The paper studied the impact of the financial accounting principles on the management accounting. There are similarities and differences between the financial accounting and management accounting. The differences are numerous, but in the present paper we are more interested in similarities that are very deep. Not accidentally, in other accounting systems, two types of accounting information form one functional, integrated circuit (accounting monism in U.S.A. or accounting systems of compromise between the accounting monism and dualism). Since there is not only one accounting system, but a set of accounting systems, the accounting principles are not absolute, but relative. This relativity is given by the assumed objectives of the accounting.

Key words: *accounting principles, expenditure and income, financial accounting, management accounting, patrimony*

INTRODUCTION

In the practice and theory of accounting, the dispute on accounting principles resulted in different views, often contradictory regarding the definition, application, classification and interpretation. The lack of consensus on the accounting principles and therefore their relativity led us to hypothesize that their choice, recognition and application is influenced by the objectives set by the accounting, and by the economic, political sector and by the ways of governance of the company.

We will present in this paper the complementarity of the two-tier accounting principles, with a major impact in building and disseminating accounting information corresponding to multiple accounting systems. We will show how these principles are implemented according to the objectives of the accounting and economic and political conditions and the way of governance of the company [1]. Moreover, the choice and definition of the accounting principles is considered to be the consequence and exercise of a power report. Building the accounting information in an accounting system is based on setting a (an) objective (s) and the

establishment of the accounting principles and rules. The definition, implementation and acceptance of these principles and rules gives "objectivity" to the chosen accounting system and allows to obtain a certain image accurate, clear, sincere and complete one regarding the heritage and the results of the company activity [2].

MATERIALS AND METHODS

We exemplified the *principle of exercises independence* by recording in the management of an economic and financial exercise of only income and expenditure related to that exercise, as well the *principle of prudence*. We also presented issues related to the management accounting, so that it is complementary to the financial accounting in double entry and because certain contingencies are relevant to the present topic.

RESULTS AND DISCUSSIONS

This section presents the similarities between the two branches of accounting that refers to that: they are mandatory, by law, using the same data, the same documents and the same

period of time; they have as common object to research the patrimony and as main objectives its efficient management and maximizing the profit; it uses accounts from the same General Accounts Plan (PCG); (when choosing the entity management, depending on its information needs and the specific circumstances of the entity).

The management accounting can be organized in one of the following three ways: by developing analytical accounts of financial accounting (grades I - VIII in PCG); by using specific accounts (class IX of accounts in PCG); by using own technical-operative evidence [3].

The accounting information should have the same qualitative features to be useful [5]: **comprehensibility** (clarity); **relevance** (pertinent), with the role and capacity of confirmation and prediction: judicious choice of optimal significance level for the accounting information, discern between what is truly important and what is not important, the opportunity and sub-unitary cost-benefit ratio play an important role to ensure its relevance; **credibility**: it is conferred by the combined influence of the characteristics of true representation, observing the principle of economic on juridical prevailing, neutrality, prudence and completeness (complete presentation of the economic reality), the optimal balance between qualitative characteristics; **comparability**: is given by the consistency of measurement and presentation of the financial effect of the same transactions and events within a company and over time for that company and for different businesses.

Also, explicitly or implicitly, changing what must be changed, they are guided by the same accounting principles. Thus explicitly the legal regulations stipulate the following general principles of management accounting[7]: **1. The principle of costs separation** relating to obtain goods, works, services expenses that are not related to the acquisition, production or processing, etc.; **2. The principle of delimitation of costs in time**, which can be rewritten as the *principle of exercise independence* in financial accounting; **3. The principle of delimitation**

of costs in space; **4. The principle of delimitation of productive costs of those non productive ones**; **5. Delimitation of costs on finite production of the costs related to costs of production in progress.**

In order to achieve in practice these principles, in the same norm [4] it is recommended to use some rational proceedings, applied with consistency, that can assimilate integrally to the *principle of permanence of methods* in the financial accounting.

We also appreciate that other principles of the financial accounting can apply, such as principle of prudence, principle of activity continuing, the principle of non set, the principle of historical cost, the principles of recording and bookkeeping, the principles of quantification (measurement and evaluation), the principles of observation, the principles of responsibility, etc..

The following examples illustrate, together or separately, two of the accounting principles set out explicitly by the Romanian accounting regulations [6]. In this way, in fact we illustrate the principles of other accounting systems, which sometimes appear differently named, grouped and systematized.

Example: The two cases that follow refer to the receipt of a long-term loan, or the use of provisions for risks and charges.

Case 1. It incurs a long-term loan in the amount of 10,000 RON, for a period of 4 years with an interest rate of 10% per year on applied to the loan balance. For simplicity, it is considered that the crediting year coincides with the economic - financial exercise, the interest payment is made at the end of each year of the loan and repayment of loan is made in one instalment at the end of the crediting period.

1. Receiving the loan, the interest calculation in year N (when the credit is received) and the interest payment:

5121 accounts to banks in lei	=	1621 long term bank credits	10.000
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%	=	1682 interests related to long term bank credits	4.000
666 Costs related			1.000

to interests			
471 Cost registered in advance			3.000

1682 Interests related to long term bank credits	=	5121 Accounts in banks in lei	1.000
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The registration of interest payment (1682 = 5121 1.000 RON) is made at the end of each of the four crediting years.

It is remarked that a separation was made between the costs and the interests related to the current exercise (N), represented by account 666, and the costs with interests related to the other three exercises (N+1, N+2 și N+3), registered in account 471. Thus, only the current costs will conclude by account 121 Profit and loss, contributing to the calculation of the current exercise result (N):

121 Profit and loss	=	666 Costs related to interests	1.000
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2. Transformation of costs registered in advance in current costs regarding the interest, registering the costs with (current) interest and concluding the account 666, in each exercise N+1, N+2 și N+3:

666 Costs related to interests	=	471 Costs registered in advance	1.000
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121 Profit and loss	=	666 Costs related to interests	1.000
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3. Integral repayment of credit at the end of crediting period:

1621 Long term bank credits	=	5121 Accounts in banks in lei	10.000
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Case 2. A provision is made for disputes (account 151.1), observing all legal and professional conditions of recognition, respectively: A. The entity has a current legal obligation or implicit obligation generated by a previous event (in our case, a legally concluded contract that led to this dispute, whether the dispute concerns the conclusion, performance, amendment, termination or interpretation of the contract). B. It is probably (there are more chances to achieve than not achieve) that an output which affects the economic benefits is needed to comply with the respective obligation. If the chances

are low (below 50%), no provision will be, but in the annexes to the balance sheet the fact will be described (the dispute) and why it was not expected. C. An estimation can be performed, a credible (evaluation) of the amount of the obligation. In fact, the use of provisions for risks and charges is applying two accounting principles (prudence and independence exercises) and the rule that requires the accounting information (and therefore financial reporting) to provide a clear, honest, faithful and complete entity patrimony, as it will be seen in the following example.

In our case, the entity has been sued by his supplier, asking him to pay the sum of 100,000 RON. The probability of losing this process and pay the sum is of 80%. If unsuccessful, the amount to be charged is 150,000 RON, because it includes attorneys' fees, expert fees, notary fees, legal fees and tax, damages or penalties, and so on, as appropriate.

1. Provision creation (to a degree of certainty of 80%):

6812 Operating costs related to provisions	=	1511 Provisions for disputes	120.000
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Thus, this is the principle of prudence: it increases the costs in advance as soon as it acknowledged the chance of probability of a negative event will generate an outflow of resources.

2. If trail was not unsuccessful until the end of exercise N, the provision is cancelled on 31.12.N by passing it to incomes:

1511 Provisions for disputes	=	7812 Incomes from provisions	120.000
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Moving on incomes may be partial, with the amount not paid yet (where, however, a part of the amount has been paid), the balance remaining on costs. In this way, it is the principle of the exercise independence and of rule to provide a clear, honest, faithful and full image of the patrimony in the sense that the management of N exercise will not be encumbered by some non-existent expenditure, and therefore can not be attributed to this exercise.

3. However, because the risk of losing the trail exists also in exercise N+1, prudently the exercise is repeated on 1.01. N+1:

6812 Operating Costs related to provisions	=	1511 Provisions for disputes	120.000
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4. If, by the revaluation of provision or modification of the operational situation, it must update its value, the appropriate records are made (6812 = 1511 for increase and 1511 = 7812 for decrease of the provision amount, with the respective sums).

5. When it is estimated that some or all expenditure required to settle a provision will be reimbursed by a third party, the reimbursement should be recognized only when it is certain that reimbursement will be received if the company honours its obligation (principle of prudence) [6]. Reimbursement should be considered a separate asset. The amount recognized for the reimbursement shall not exceed the amount of the provision. From an accounting perspective, the company will record a provision for the full amount of the debt:

6812 Operating costs related to provisions	=	1511 Provisions for disputes	120.000
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When the company is sure that the reimbursement will be received, an asset will be recognized:

5121 Accounts in banks in lei	=	7XXX Incomes from provisions reimbursement	120.000
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And simultaneously, the provision made is cancelled partially or totally, if applicable:

1511 Provisions for disputes	=	7812 Incomes from provisions	120.000
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CONCLUSIONS

The future belongs to the perennial values and accounting principles that they represent. Only this way fair competition is ensured among firms, a uniform interpretation of the accounting information.

As proposals: 1. Equalize or at least harmonization at international level of the concepts of axioms, postulates, principles or rules as principles in financial accounting

system; 2. Development of some clearer and more transparent rules in terms of accounting principles that govern by indicating explicitly the principle/accounting principles underlying, indicating the limits, the circumstances and nuances of understanding and application, in order not to be required further interpretation guides; 3. Application by accounting professionals, in a more uniform manner of the accounting principles and standards, with rigorous argument of the exemptions generated by personal „creativity”.

REFERENCES

- [1]**OMFP 3055/2009, on the approval of accounting rules according to the European directives, The Official Gazette no. 766/10.nov.2009
- [2]**OMFP 1286/2012, on the approval of the accounting rules according to the International Standards of financial reporting, The Official gazette no. 678/04.oct.2012
- [3]**Law 82/1991 – Law of accounting (republished 18.06.2008 and update 22.04.2011)
- [4] **. OMFP no 1912/2010 for the approval of the Predictions on some measures related to the organization and administration of *management* accounting, the Romanian Official Gazette, part I, no. 23/12.01.20011.
- [5]Pierre F., Besançon E., Valorisation d’entreprise et théorie financière, Ed. D’Organisation, Paris, 2011, p. 181
- [6]Tournier J.C., Tournier J.B.,2010, Evaluation d’entreprise, Troisième édition, Ed. D’Organisation, Paris, p. 139
- [7] Stan S., 2011, Evaluation of unlisted companies necotate, Editor Tribuna Economică, București, p. 97

ANALYSIS OF THE NATURAL POTENTIAL AND OF THE AGRICULTURAL STRUCTURES IN THE RURAL AREA

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Abstract

The immediate effect of the application of the Land Law in Călărași county agriculture, the restructuring of the farm units configuration by preponderance of small individual land, reduced the positive implications of the privatization process, resulting in a less viable economic model in terms of resources and efficiency. These structures determined the intensive consume of labour force, which led to the attraction of part of the labor force in other sectors, in agriculture, representing small farmers producing for own consumption and for selling products on the rural market.

Key words: economic mechanisms, intensive development, market system, natural potential.

INTRODUCTION

Integrating the agriculture in the market system is ensured by strengthening the private system and a type of economic organization in which natural processes join with the economic mechanisms in a manner that creates an organic balance – supply and demand. For this purpose, development strategies are needed that exploit the benefits created by the dominant share of the private ownership in agriculture and ensure intensive development to achieve the competitive supply of agricultural products and on an expanded market for all types of farms, widely available on product market and factors production [1]. **The agriculture** is the main economic activity. Its base is the agricultural area of 420 780 ha, respectively, 2.9% of the country's agricultural surface, 8th largest among the counties. Of this area, 413,135 ha is arable land, respectively, 4.4% of arable land and 5th place in the top of the counties [2].

The stakeholders that could contribute to the development of the rural communities directly are the local authorities, the local companies interested in promoting activities and especially their products, thus interested in local economic development by promoting

electronic commerce, providing financial and technical assistance for adoption of innovative solutions in the private sector, teachers, students who wish to return to the community after graduation, the initiative committees established under the projects implemented in the recent years in the village (they have experience in identifying and prioritizing needs - public consultation but especially in identifying funding sources and implementation of various projects) and the investors attracted by the facilities (infrastructure, the potential of young people, spaces, possibility to connect to the gas network in the near future, the inner land available for house construction and for investments).

MATERIALS AND METHODS

For a more complex characterisation of the county, the analysis took into consideration the most important features of the social and economic sector, expressed by a set of analysis criteria. The analysis of these sectors allowed the identification of the development stage and of the resources needed to endure a sustainable development. In order to make this complex analysis with a high level of

objectivity, a set of criteria was given to each sector that highlights the problems existing within it.

RESULTS AND DISCUSSIONS

The immediate effect of the application of the Land Law in Călărași county agriculture, the restructuring of the the farm units configuration by preponderance of small individual land, reduced the positive implications of the privatization process, resulting in a less viable economic model in terms of resources and efficiency. These structures determined the intensive consume of labour force, which led to the attraction of part of the labor force in other sectors, in agriculture, representing small farmers producing for own consumption and for selling products on the rural market.

In the table 1., the evolution of cultivated surface in exploitation profile is presented, with the main crops, in the period 1995- 2012. From the data presented, it appears that the area under cultivation - total, varied, recording 410,080 ha in 1995, 392,909 ha in 2000, 414,803 ha in 2005, after which it reaches 408,548 ha in 2012. The crops cultivated areas show the same oscillations, the share of total cultivated area, assuming the culture of cereal grains, ie 275,322 ha in 1995, reaching 296,322 ha in 2000 and 270,400 ha in 2012.

The sunflower and vegetables crops that have been with the same oscillations as the bean and potato crops ranks in a descendant trend from 1151 ha in 2000, in 2012, only 391 ha were cultivated. We note that, since 2005, every year the cultivated area has increased with green fodder from 12346 ha to 21449 ha in 2012 [6].

In the table 2. the evolution of production and agricultural services and its dynamics is presented, on total branches and sectors in the period 2000-2012, expressed in thousand lei prices of period. It is thus an increasing trend of total production from 779705,9 thousand lei in 2002 to 16.884.651 thousand lei in 2005 and 2.041.731 thousand lei in 2012. Within the total production, the share is owned by the

vegetal production, followed by livestock production and agricultural services.

Table 1. Dynamics of the surfaces cultivated in exploitation profile, with the main crops, in Călărași county, for the period 1995-2012

SPECIFICA TION	UM	1995	2000	2005	2007	2012
Cultivated surface – total	Ha	410080	392909	414803	406322	408548
	%	100	95,8	101,2	99,1	99,6
Cereals for grains	Ha	275322	252587	253563	262635	270400
	%	100	91,7	92,1	95,4	98,2
Wheat and rye	Ha	119007	126112	125055	145406	161372
	%	100	106	105,1	122,2	135,6
Barley	Ha	25211	18922	27309	27289	27335
	%	100	75,1	108,3	108,2	108,4
Maize	ha	127652	105455	110672	92890	79486
	%	100	82,6	86,7	72,8	62,3
Vegetables for grains	ha	1230	2476	3216	3665	3885
	%	100	201,3	261,5	298	315,9
Sunflower	ha	57994	71117	83050	114462	66741
	%	100	122,6	143,2	197,4	115,1
Green fodder in arable land	ha	-	-	12346	20348	21449
	%	-	-	100	164,8	173,7
Potatoes	ha	1047	1151	609	453	391
	%	100	109,9	58,2	43,3	37,3
Vegetable	ha	4875	3797	4162	3776	3039
	%	100	77,9	85,4	77,5	62,3

Source: Statistical researches, County Statistic Direction, DADR Calarasi[7,8].

Regarding changing the use of land in Călărași county, as shown by the data presented in Table 3, it is noted that in 2012 compared to 2005 , the total agricultural area decreased from 426780 ha to 426 230 ha , registered decrease also by total arable land, from 415 779 ha to 414 821 ha in the same period.

In the same way is the area occupied by orchards, which decreased from 311 ha to 172 ha and that occupied with vineyards that reduced in the same period, from 5246 ha to 4965 ha.

By locality, significant changes in the arable land are registered in large communes, such as Grădiștea (from 15580 to 14752 ha ha), Borcea (from 30363 ha to 29680 ha), Jegălia (from 10 476 ha to 9992 ha), Modelu (from 9887 ha to 9438 ha) etc, while arable land increases registered in localities Budești,

Căscioarele, Ulmeni, Vasilați etc, but in a less share than the reduced surfaces [4].

Table 2. Dynamics of the agricultural production of goods and agricultural services, in Călărași county - thousand lei current prices-

Years	UM	Total	Vegetal	Animal	Agricultural services
2000	Thousand lei	779705,9	548646,7	208718,8	22340,4
	%	100,0	70,4	26,8	2,9
2005	Thousand lei	1688465,1	1218727,4	434645,9	35091,8
	%	100,0	72,2	25,7	2,1
2007	Thousand lei	1738264	1336817	364199	37248
	%	100,0	76,9	21,0	2,1
2012	Thousand lei	2041731	1514423	488767	38541
	%	100,0	74,2	23,9	1,9

Source: Statistical researches – County Direction of Statistics, DADR Călărași [7, 8],

Affected by the restructuring process in which is the entire Romanian society, the economy has the potential to revive Călărași county, based on the following strengths: agricultural potential, technical potential, water resources that can foster the development of fisheries, commercial activities, industry and tourism on the Danube and inner rivers; the geographical position on the border and crossroads of transit routes between Asia and Eastern Europe, access to the waterway.

On categories of use of agricultural land [3], it is significant the change of the way of use at category “vineyards”, where all localities increased the surfaces occupied with vineyards, some of them even five times increase, such as: Borcea, Chirnoși, Ciocănești, Cuza Vodă, Jegălia, Dorobanțu, Radovanu, Nicolae Bălcescu, Unirea etc., the only locality that reduced the surface occupied with vineyards being Al. Odobescu, from 189 ha, maintaining in crop 105 ha.

Regarding the surfaces occupied with orchards, it can be seen that more localities abolished these crops, although they had a significant number of hectares occupied with orchards, such as: Lupșanu - 26 ha, Jegălia – 25 ha, Dragalina – 17 ha, Lehliu – 27 ha, Al. Odobescu and Valea Argovei 16 ha each, etc., but the same localities increased the number of hectares occupied with pastures

and meadows, direct result of the increase of livestock in the individual farms and in agricultural associations [5].

Table 3. Structure of land, according to use

Specification	2005		2007		2012	
	ha	%	Ha	%	ha	%
Total surface of landr	508785	100,0	508785	100,0	508785	100,0
Agricultural surface	426780	83,9	426632	83,9	426230	83,8
Arable	416029	81,8	415966	81,8	414821	81,5
Pastures	5281	1,0	5235	1,0	6130	1,2
Meadows	134	0,0	134	0,0	142	0,0
Vineyards and viticultural nursery	5120	1,0	5120	1,0	4965	1,0
Orchards and trees	216	0,0	177	0,0	172	0,0
Forests and other lands with forest vegetation	22001	4,3	22001	4,3	22052	4,3
Lands occupied with constructions and yards	14634	2,9	14782	2,9	15531	3,1
Roads and railways	13158	2,6	13158	2,6	12962	2,5
Rivers and ponds	29906	5,9	29906	5,9	29723	5,8
Other surfaces ¹⁾	2306	0,5	2306	0,5	2287	0,4

¹⁾ Corresponds to category “non productive land”.

Source: Statistical researches – County Direction of Statistics, DADR Călărași [7,8]

From the total surface of 292 154 ha, 112 895 ha are exploited in associative system, 93609 ha are on lease system and 85650 ha are set up as individual farms. The land use categories, we note that, in the individual farms of the 85 650 ha, 77 646 ha are arable land, 7,750 hectares are vineyards, 198 ha are occupied by pastures and meadows and 56 ha with orchards. Within the associative farms (S.A + S.C. + A.F.), of 112895 ha, 112777 ha represent arable land and 118 ha are occupied with vineyards; within this type of farms, there are no use categories of “orchards” nor pastures or meadows. We see the same situation also within the companies created by land lease where, of 93609 ha, only 2 ha are occupied with vineyards and 5 ha with pastures, the difference of 93602 ha, representing arable land [3]. Although in most localities in the county the system of

land exploitation is made in associations and on lease, such as in localities: Cuza Vodă - 74% in association and 9% on lease, Lupșanu - 78% in association and 14% on lease, Ulmu - 95% in association, Ulmeni - 81% in association and 9% on lease etc., still there are localities in which, over 50% of the agricultural surface is exploited in individual system, such as: Căscioarele - 85%, Tămădău - 65%, Belciugatele - 60%, Fundulea - 61%, Budești - 59%, Frumușani and Nana - 58% etc [8].

CONCLUSIONS

In the conditions of the current dimensions of the individual farms in Romania, the rational exploitation of the land needs the stimulation of lease, of association and concentration of property by purchasing agricultural lands. The legislation in force gives the possibility to increase the territory dimensions of the farms and encourages the exploitation of the land directly by the owner or by the farmer.

Affected by the restructuring process in which is the entire Romanian society, the economy has the potential to revive Călărași county, based on the following strengths: agricultural potential, technical potential, water resources that can foster the development of fisheries, commercial activities, industry and tourism on the Danube and inner rivers; the geographical position on the border and crossroads of transit routes between Asia and Eastern Europe, access to the waterway.

A way to revive the rural area in the regional economic context, is the development and promotion of its specific services sector and activities based on local resources use. The potential of the rural area, largely viewed only through the existing agricultural areas and activities related to their work relies on the existence of the specific resources insufficiently exploited until now and may be an alternative and also an opportunity to diversify the rural economy, such as activities related to agriculture, with non-agriculture specific in the sector of agro-food products processing, manufacturing processing and agrotourism. In the current economic

situation, the development of this sector is based on the revival of the traditional crafts and the use of qualified labor force is refining for the socio - economic development of the rural area.

REFERENCES

- [1]*** Agency of Payments for Rural Development and Fishing Călărași
- [2]*** Analiza situației curente PND 2007-2013, Direcția Generală Dezvoltare Rurală Autoritate de Management pentru PNDR http://www.madr.ro/pages/dezvoltare_rurală/
- [3]*** Council Conclusions on a strategic framework for European cooperation in education and training ("ET 2020"), <http://www.edu.ro/index.php/articles/12044>
- [4] Iova Radu Andrei, Daniela Cretu -, „Perception of the life quality in the rural communities in Romania case study- Călărași county, Lambert Academic Publishing, Germania
- [5] Iova Radu Andrei -The analysis of the potential for the economic re-launch of Călărași county Scientific papers series management , economic engineering in agriculture and rural development vol. 11 (1) /2013 , Editura DO-MINO, București 2013
- [6]*** Regional Development Agency, Development Plan of Muntenia Region, http://www.adrmuntenia.ro/documente/1195475713_1.pdf
- [7]*** Statistical researches – County Direction of Statistics, Călărași
- [8]*** Statistical researches – DADR Călărași

GENERAL ASPECTS REGARDING THE EVOLUTION OF ROMANIAN SPECIALIZED FARMS BASED ON FADN DATA

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Abstract

The aim of this paper is to analyze and compare the evolution of specialized COP, horticulture, dairy and mixed Romanian farms. The research of this evolution is a very important step in understanding the elements that can affect the modernization process of our agriculture. For accomplishing the research we utilized the data for 2007-2009 periods from Farm Accountancy Data Network (FADN) which collect information from different types of specialized farms. The main results revealed the following: the net farm income had increased during 2007-2009 only in mixed crop and mixed livestock farms; work productivity was higher in COP farms but increased the most in livestock farms; the productivity ratio was higher in COP farms; the solvability had dropped during 2007-2009 period; even with higher liquidity, mixed crop farms present a reduction of this ratio. In conclusion, the specialized farms present, along with the increase of their rate of specialization a better financial stability and an improvement in work productivity, but only the mixed farms show an improvement in net income.

Key words: income, liquidity ratio, productivity ratio, solvability ratio, specialized farm

INTRODUCTION

In Romania, during the period 2007-2009, the value of production in real terms increased to 11.8%, mainly due to increase in value of crop production, while animal production value had declined mainly due to reduction of livestock [2]. Also, other important aspects of Romanian agriculture are: farmers obtaining low productivities per hectare; over 94% of farms have less than 4 ESU [7]; the crop production sector presents a great variability in terms of cultivated area, production and average production [4]; over 60% of farms (big and specialized farms with COP, crops and granivores) have a direct economic dependence of subsidies [8].

In this context, the specialization of Romanian farms becomes an important step to insure a proper use of natural and economic resources and to reach a higher performance, especially since many specialists consider that to achieve economic efficiency there is a fundamental need to specialize agricultural production [5] and others demonstrated that a specialized farm is more technically efficient [3].

MATERIALS AND METHODS

In order to characterize the evolution of specialized farms in our country we utilized the FADN indicators and methodology. The FADN main criteria used to define specialized farms is a share of main production sector higher than 50% of the total output and coupled subsidies [9].

The FADN data are representative for over 860 thousand specialized farms (Table 1).

Table 1. FADN specialized farms structure

Specification	UM	2007	2008	2009
TOTAL	No	864960	866860	866870
COP	%	9.8	15.5	14.3
UAA	ha/farm	47.75	37.2	40.09
Economic dimension	UDE	7.4	5.7	6.0
Dairy	%	14.7	14.1	11.6
UAA	ha/farm	6.05	8.51	7.99
Economic dimension	UDE	2.6	3.7	3.7
Mixed crop	%	21.0	11.6	12.0
UAA	ha/farm	5.32	6.75	7.9
Economic dimension	UDE	1.9	2.4	2.6
Mixed livestock	%	12.1	17.1	17.2
UAA	ha/farm	4.66	4.33	5.13
Economic dimension	UDE	2.0	2.2	2.3

Source: FADN

The available data at this time are only for the period 2007-2009, but FADN is a viable

instrument which offers through its TF14 classification, detailed information regarding the main economic indicators of specialized farms.

Starting from the FADN data, due to our research objectives, all the indicators were analyzed and compared based on their evolution per hectare/LSU or AWU. Also we compared the farms' main results based on the following indicators: FNVA/AWU; the multi-factor productivity ratio (total output-to-total input); Solvency (liabilities-to-assets ratio, indicating the proportion of liabilities (total loans to be repaid) used to finance assets); Liquidity (current assets-to-short-term liabilities ratio) [10].

RESULTS AND DISCUSSIONS

Regarding the farms' economical results obtained during the 2007-2009 period first of all we want to draw attention on the variation between data. The main factor of change in the observed population is the specialization rate, i.e. the share of main production output and subsidies in total output and coupled subsidies. This rate is sensitive to the relative price of main products of the farm in the way that when agricultural prices are stable, so is the specializations rate. But in the last few years, the volatility of prices meant that a farm which was considered specialized in a given year could not belong to the 'population' of observed farms the next year, and vice versa [5]. In the 2007-2009 period the rate of specialization increased in almost all specialized farms, with exception of dairy and mixed livestock farms (Table 2). This situation is due exactly like we mentioned above to the volatility of prices (especially that of milk).

In this context, we may appreciate that, in general, the specialization rate increased in Romanian agriculture. The main issue remains in this situation to analyze if along with this increase or decrease of specialization, which was the evolution of main income of these farms.

The COP specialized Farms

COP specialized farms have almost 70% cultivated area with cereals, while the average UAA was over 40 hectares.

Table 2. Rate of specialization - share of main production output and subsidies in total output and coupled subsidies

Specification	2007	2008	2009	2009/2007 %
COP	76.2	75.9	87.1	114.3
Dairy	67.3	56.4	50.2	74.6
Mixed crop	80.4	81.6	81.7	101.6
Mixed livestock	59.2	56.5	54.2	91.6
Mixed crop and livestock	81.1	76.8	86.1	106.2

Source: own calculation on the basis of data from FADN <http://ec.europa.eu/agriculture/rica/>

We observe an increase of forage crop surfaces and livestock units which show us that the tendency of these farms is to complete their main activity (COP production) within a mixed system. But the cereal production remains the main source of income, these representing 96.6% of total output.

The economic size decreased in 2007-2009 period with 18.9% to a level of 6 ESU while total output decreased by 22%.

Table 3. The main incomes of COP specialized farms – expressed in euro/AWU and euros/ha

Specification	2007	2009	2009/2007 %
Total labour input (SE010)	2.18	1.51	69.3
Total Utilised Agricultural Area	47.75	40.09	84.0
Euros/AWU			
Total output	9519.3	10723.2	112.6
(-) Total intermediate consumption	6994.0	7519.9	107.5
(+)(c)Current balance subsidies & taxes	3281.7	2992.1	91.2
Decoupled payments	1067.0	1864.9	174.8
(-) Devaluation	1231.2	1533.8	124.6
(=) Farm Net Value Added (FNVA)	4575.7	4661.6	101.9
(-) Total external factors	2515.1	2275.5	90.5
Wages paid	1286.7	1035.1	80.4
Rent paid	1078.9	1096.0	101.6
Interest paid	149.5	145.0	97.0
(+)Subsidies balance & taxes on investments	132.6	86.8	65.4
(=) Farm Net Income (FNI)	2193.1	2472.8	112.8
Euros/UAA			
Total output	434.6	403.9	92.9
(-) Total intermediate consumption	319.3	283.2	88.7
(+)Current balance subsidies & taxes	149.8	112.7	75.2
Decoupled payments	48.7	70.2	144.2
(-) Devaluation	56.2	57.8	102.8
(=) Farm Net Value Added (FNVA)	208.9	175.6	84.0
(-) Total external factors	114.8	85.7	74.6
Wages paid	58.7	39.0	66.4
Rent paid	49.3	41.3	83.8
Interest paid	6.8	5.5	80.0
(+)Subsidies balance & taxes on investments	6.1	3.3	54.0
(=) Farm Net Income (FNI)	100.1	93.1	93.0

Source: own calculation on the basis of data from FADN <http://ec.europa.eu/agriculture/rica/>

Because of the input/output rate of 1.06 (input 17107 euro/farm and output 16192 euro/farm), the gross farm income reached a level of 9356 euro/farm (with 26.1% lower than in 2007) and farm net value added a value of 7039 euros/farm (with 29.4% lower than in 2007).

Regarding the evolution of income in COP specialized farms (Table 3), we may observe an increase in work productivity (due not only to the increase of incomes but also to a lower AWU), and a decrease of income per hectare.

The lower values per hectare are due especially to the prices from 2009 that affected the receipts. We may also observe an increase of share of direct payments in FNVA from 23.3% to 40.0%, and a share of total subsidies of 64.4% in 2009. This is a very important fact because it shows that COP farms depend very much on subsidies.

The Dairy specialized Farms

In Romania, the non-specialized farms produce 28% of the milk production, while the specialized farms the remaining 72% [1]. Dairy specialized farms have 69.5% cultivated area with forage crops, while the average UAA was around 8 hectares. From this UAA, only 70% is cultivated with forage crops, the lowest forage area among EU-27 Member states [6].

We observe an increase in LSU per farm, with 48.9%, from which over 63% were dairy cows and almost 28% were other cattle. From total output, 54.2% come from cows' milk and milk products and 32% from crop production. In the 2007-2009 period, the economic size increased with 42.3% (to 3.7 ESU) and total output with 18.3%. Because of the input/output rate of 0.67 (input of 9085 euros/farm and output of 13582 euro/farm), the gross farm income reached a level of 7935 euros/farm (with 7.1% higher than in 2007) and farm net value added a value of 6913 euros/farm (with 2.5% higher than in 2007).

Regarding the evolution of income in Dairy specialized farms (Table 4), we may also observe an increase in work productivity and a decrease of income per LSU (due to lower prices than in 2007).

The share of total subsidies in FNVA of 21.1% in 2009, lower than in 2007,

considering the increase of the share of decoupled payments, reflects that farms received smaller subsidies for livestock.

Table 4. The main incomes of Dairy specialized farms – expressed in euros/AWU and Euro/ha

Spcification	2007	2009	2009/2007 %
Total labour input (SE010)	1.99	1.82	91.5
Total livestock units	8	11.91	148.9
Euros/AWU			
Total output	5770.9	7462.6	129.3
(-) Total intermediate consumption	2938.2	3904.4	132.9
(+)Current balance subsidies & taxes	892.0	801.1	89.8
Decoupled payments	145.7	311.5	213.8
(-) Devaluation	334.7	561.5	167.8
(=) Farm Net Value Added (FNVA)	3389.9	3797.8	112.0
(-) Total external factors	403.5	525.8	130.3
Wages paid	228.6	398.9	174.5
Rent paid	92.0	85.2	92.6
Interest paid	82.9	41.8	50.4
(+)Subsidies balance & taxes on investments	0.0	0.0	0.0
(=) Farm Net Income (FNI)	2986.4	3272.0	109.6
Euros/LSU			
Total output	1435.5	1140.4	79.4
(-) Total intermediate consumption	730.9	596.6	81.6
(+)Current balance subsidies & taxes	221.9	122.4	55.2
Decoupled payments	36.3	47.6	131.3
(-) Devaluation	83.3	85.8	103.1
(=) Farm Net Value Added (FNVA)	843.3	580.4	68.8
(-) Total external factors	100.4	80.4	80.1
Wages paid	56.9	61.0	107.2
Rent paid	22.9	13.0	56.9
Interest paid	20.6	6.4	30.9
(+)Subsidies balance & taxes on investments	0.0	0.0	0.0
(=) Farm Net Income (FNI)	742.9	500.0	67.3

Source: own calculation on the basis of data from FADN <http://ec.europa.eu/agriculture/rica/>

The Mixed crop specialized Farms

Mixed crop specialized farms have almost 65% of the area cultivated with cereals, 18% with forage crops and 5% with permanent crops, while the UAA was between 5 and 8 hectares. For these farms we observe also an increase of forage crop surfaces of 36.5% and livestock units of 56.9% which also show us the tendency to complete their main activity with livestock production.

But the crop production remains the main source of income, these representing 80.1% of total output (from which 24.2% cereals, 22.3% vegetables and flowers, 10.6% fruits and 9.9% forage crops).

In the 2007-2009 period, the economic size increased with 36.8% to a level of 1.47 ESU and total output with 28.2%. Because of the input/output rate of 0.6 (input of 5742 euros/farm and output of 9519 euros/farm), the gross farm income reached a level of 5904

euros/farm (with 27.0% higher than in 2007) and farm net value added a value of 4877 euros/farm (with 31.5% higher than in 2007). Regarding the evolution of income we observe the same situation like in COP farms (Table 5), respectively an increase of work productivity. The data calculated for a hectare reveal a decrease of FNVA, but due to the low level of wages, farm net income increased with 69%.

Table 5. The main incomes of Mixed crop specialized farms – expressed in Euro/AWU and euro/ha

Spfication	2007	2009	2009/2007 %
Total labour input (SE010)	1.99	1.47	73.9
Total Utilised Agricultural Area	5.32	7.9	148.5
Euros/AWU			
Total output	3731.7	6475.5	173.5
(-) Total intermediate consumption	1549.2	2925.9	188.9
(+)Current balance subsidies & taxes	153.3	467.3	304.9
Decoupled payments	126.6	371.4	293.3
(-) Devaluation	471.4	698.6	148.2
(=) Farm Net Value Added (FNVA)	1864.3	3318.4	178.0
(-) Total external factors	970.4	281.6	29.0
Wages paid	924.1	217.7	23.6
Rent paid	24.1	61.2	253.8
Interest paid	22.1	2.7	12.3
(+)Subsidies balance & taxes on investments	0.0	0.0	0.0
(=) Farm Net Income (FNI)	894.0	3036.7	339.7
Euros/UAA			
Total output	1395.9	1204.9	86.3
(-) Total intermediate consumption	579.5	544.4	93.9
(+)Current balance subsidies & taxes	57.3	87.0	151.7
Decoupled payments	47.4	69.1	145.9
(-)Devaluation	176.3	130.0	73.7
(=) Farm Net Value Added (FNVA)	697.4	617.5	88.5
(-) Total external factors	363.0	52.4	14.4
Wages paid	345.7	40.5	11.7
Rent paid	9.0	11.4	126.3
Interest paid	8.3	0.5	6.1
(+)Subsidies balance & taxes on investments	0.0	0.0	0.0
(=) Farm Net Income (FNI)	334.4	565.1	169.0

Source: own calculation on the basis of data from FADN <http://ec.europa.eu/agriculture/rica/>

We observe a share of total subsidies in FNVA of 15.4% in 2009 and an increase of share of direct payments in FNVA from 6.8% to 11.2%, but the contribution of this subsidies to income formation remain low due to the small UAA per farm.

The Mixed livestock specialized Farms

Mixed livestock specialized farms have 48.15% cultivated area with cereals and 45.42% with forage crops, while the average UAA was around 5 hectares. We observe an increase in LSU per farm, with 17.4%, and from total LSU, 47% were dairy cows and cattle, 18.3% sheep and goats, 21.76% pigs

and 9.51% poultry. From total output, 58.6% come from livestock production sales and 41.1% from crop production.

In the 2007-2009 period, the economic size increased with 15.0% (to 2.3 ESU) and total output with only 1.9%. In condition of an input/output rate of 0.7 (input of 5146 euros/farm and output of 7357 euros/farm), the gross farm income reached a level of 3871 euros/farm (with 28.6% higher than in 2007) and farm net value added a value of 3026 euros/farm (with 37.7% higher than in 2007). Regarding the evolution of income in mixed specialized farms (Table 6), we observe an increase in work productivity and an increase of incomes per LSU due to the fact that the dynamics of outputs was higher than the dynamics of inputs.

Table 6. The main incomes of Mixed livestock specialized farms – expressed in euros/AWU and Euro/ha

Spfication	2007	2009	2009/2007 %
Total labour input (SE010)	2.03	1.49	73.4
Total livestock units	5.91	6.94	117.4
Euros/AWU			
Total output	3557.1	4937.6	138.8
(-) Total intermediate consumption	2385.2	2710.1	113.6
(+)Current balance subsidies & taxes	310.8	370.5	119.2
Decoupled payments	114.3	238.3	208.5
(-) Devaluation	400.5	566.4	141.4
(=) Farm Net Value Added (FNVA)	1082.3	2031.5	187.7
(-) Total external factors	140.9	177.2	125.8
Wages paid	89.7	140.3	156.5
Rent paid	18.2	32.9	180.4
Interest paid	33.0	3.4	10.2
(+)Subsidies balance & taxes on investments	0.0	10.7	-
(=) Farm Net Income (FNI)	941.4	1865.1	198.1
Euros/LSU			
Total output	1221.8	1060.1	86.8
(-) Total intermediate consumption	819.3	581.8	71.0
(+)Current balance subsidies & taxes	106.8	79.5	74.5
Decoupled payments	39.3	51.2	130.3
(-)Devaluation	137.6	121.6	88.4
(=) Farm Net Value Added (FNVA)	371.7	436.2	117.3
(-) Total external factors	48.4	38.0	78.6
Wages paid	30.8	30.1	97.8
Rent paid	6.3	7.1	112.8
Interest paid	11.3	0.7	6.4
(+)Subsidies balance & taxes on investments	0.0	2.3	-
(=) Farm Net Income (FNI)	323.4	400.4	123.8

Source: own calculation on the basis of data from FADN <http://ec.europa.eu/agriculture/rica/>

Because of the small amount of UAA per farm, the share of direct payments in Farm Net Value Added remained at 10-11%, but we observe a decrease in received subsidies per LSU of 25.5%. Actually, the share of total

subsidies in FNVA decreased from 33.0% in 2007 to an amount of 19.9% in 2009.

The Mixed crop and livestock specialized Farms

Mixed crop and livestock specialized farms have 57.14% cultivated area with cereals and 32.11% with forage crops, while the average UAA was around 7 hectares. We observe an increase in LSU per farm, with 44.4%, and from total LSU 51.05% were dairy cows and cattle, 17.15% sheep and goats, 20.08% pigs and 9.21% poultry. From the total output, 43.5% come from livestock production sales and 55.8% from crop production.

Table 7. The main incomes of Mixed crop and livestock specialized farms – expressed in euros/AWU and Euro/ha

Spfication	2007	2009	2009/2007 %
Total labour input (SE010)	1.89	1.47	77.8
Total Utilised Agricultural Area	5.36	7.07	131.9
Total livestock units	3.31	4.78	144.4
Euros/AWU			
Total output	3302.1	5200.0	157.5
(-) Total intermediate consumption	1739.7	2838.8	163.2
(+)Current balance subsidies & taxes	269.8	610.2	226.1
Decoupled payments	137.6	368.0	267.5
(-) Devaluation	388.4	722.4	186.0
(=) Farm Net Value Added (FNVA)	1443.9	2249.0	155.8
(-) Total external factors	248.7	280.3	112.7
Wages paid	212.7	215.0	101.1
Rent paid	24.3	56.5	232.0
Interest paid	12.2	8.8	72.7
(+)Subsidies balance & taxes on investments	0.0	0.7	
(=) Farm Net Income (FNI)	1195.2	1969.4	164.8
Euros/UAA			
Total output	1164.4	1081.2	92.9
(-) Total intermediate consumption	613.4	590.2	96.2
(+)Current balance subsidies & taxes	95.1	126.9	133.3
Decoupled payments	48.5	76.5	157.7
(-) Devaluation	136.9	150.2	109.7
(=) Farm Net Value Added (FNVA)	509.1	467.6	91.8
(-) Total external factors	87.7	58.3	66.5
Wages paid	75.0	44.7	59.6
Rent paid	8.6	11.7	136.8
Interest paid	4.3	1.8	42.9
(+)Subsidies balance & taxes on investments	0.0	0.1	
(=) Farm Net Income (FNI)	421.5	409.5	97.2
Euros/LSU			
Total output	1885.5	1599.2	84.8
(-) Total intermediate consumption	993.4	873.0	87.9
(+)Current balance subsidies & taxes	154.1	187.7	121.8
Decoupled payments	78.5	113.2	144.1
(-) Devaluation	221.8	222.2	100.2
(=) Farm Net Value Added	824.5	691.6	83.9
(-) Total external factors	142.0	86.2	60.7
Wages paid	121.5	66.1	54.4
Rent paid	13.9	17.4	124.9
Interest paid	6.9	2.7	39.1
(+)Subsidies balance & taxes on investments	0.0	0.2	
(=) Farm Net Income	682.5	605.6	88.7

Source: own calculation on the basis of data from FADN <http://ec.europa.eu/agriculture/rica/>

In the 2007-2009 period, the economic size increased with 36.8% (to 2.6 ESU) and total output with 22.5%. In conditions of an input/output rate of 0.74 (input of 5647 euros/farm and output of 7644 euros/farm), the gross farm income reached a level of 4368 euros/farm (with 26.2% higher than in 2007) and farm net value added a value of 3306 Euro/farm (with 21.2% higher than in 2007).

The evolution of the main indicators (Table 7) reveal an increase in work productivity (also because of the rise in output and decrease of AWU) and a decrease of incomes per LSU and UAA due to the fact that the dynamics of outputs was lower than the dynamics of inputs and especially due to the lower prices from 2009.

Because of the small amount of UAA per farm, the share of direct payments in Farm Net Value Added remain at 10-11%, but we observe a decrease in received subsidies per LSU of 25.5%. Actually the share of total subsidies in FNVA decreased from 33.0% in 2007 to an amount of 19.9% in 2009.

Table 8. The main incomes of Mixed crop and livestock specialized farms – expressed in Euro/AWU and Euro/ha

Spfication	2007	2009	2009/2007 %
FNVA/AWU			
COP	4575.7	4661.6	101.9
Dairy	3389.9	3797.8	112.0
Mixed crop	1864.3	3318.4	178.0
Mixed livestock	1082.3	2031.5	187.7
Mixed crop and livestock	1443.9	2249.0	155.8
Productivity ratio (input-to-output)			
COP	1.13	1.06	93.6
Dairy	0.64	0.67	105.0
Mixed crop	0.80	0.60	75.3
Mixed livestock	0.82	0.70	85.0
Mixed crop and livestock	0.72	0.74	102.6
Solvency			
COP	0.041	0.070	169.8
Dairy	0.013	0.070	550.7
Mixed crop	0.000	0.019	-
Mixed livestock	0.001	0.034	3305.3
Mixed crop and livestock	0.002	0.006	279.8
Liquidity			
COP	10.5	13.6	129.6
Dairy	3.5	61.0	1760.6
Mixed crop	5558.0	3965.0	71.3
Mixed livestock	24.7	1405.0	5690.5
Mixed crop and livestock	68.6	169.2	246.6

Source: own calculation on the basis of data from FADN <http://ec.europa.eu/agriculture/rica/>

Farm economics overview

The FNVA/AWU obtained in the 2007-2009 period are higher in COP specialized farms

and lower in mixed livestock farms (Table 8). The income in mixed farms increased more than in other farms, with even 87.7% in mixed livestock farms.

The productivity ratio shows that in COP farm for one euro spent, 1.06 was earned, and that in the other farms the amount was only 0.6-0.7 euros per euro spent. This ratio evolves with a decreasing trend in COP, mixed crop and mixed livestock farms due to the public support which increase the incomes.

Solvency ratio (the ability to pay the debts), with an evident increasing tendency in all types of farms, demonstrate that the financial situation was deteriorating during the 2007-2009 period, especially in mixed livestock farms. The increasing values of this ratio show that the farms didn't meet their payment obligations, but the level is low.

Liquidity ratio (which measures the relation between current assets and current liabilities) demonstrate that the COP and dairy farms seem to be the least liquid, but the situation was improving in 2009.

CONCLUSIONS

The main conclusion regarding the evolution of specialized Romanian farms during 2007-2009 periods can be summarized as follows: all the farms present a better work productivity due to the decrease of AWU and the increase of total output per farm; all the farms present a decrease in incomes obtained per hectare/LSU but in crop farms this situation is due to the reduction of income values and for the other farms is due to the increase of UAA and LSU; the crop farms depend in a higher measure on subsidies and have the higher work productivity and productivity ratio due especially to the public support but also to the UAA dimension; the dairy farms present a decrease of almost 32% in net income, a low solvency and an improvement of liquidity; the mixed crop farms present the higher growth of net income and the higher liquidity; the mixed livestock farms present also an increase of net income and the highest growth of work productivity and liquidity; the mixed crop and livestock

farms present a decrease in net income, a low solvency and liquidity compared to the other mixed farms.

REFERENCES

- [1]Alboiu, C., Alexandri, C., Grodea, M., Ionel, I., Toderoiu, F., Moldovan, M., & Luca, L., 2011, The main direction of the Romanian agricultural sector evolution following the EU integration. European Union Food Sector after the last enlargements, 30-61.
- [2]Dobre Carina, Iorga Adina, Toma Elena, Muscănescu Alexandra, 2012, Evolution of Romanian agriculture in the period 2007-2010, Scientific Papers Series "Management, Economic Engineering in Agriculture and Rural Development", 12(1):49-52
- [3] Bojnec, S., Latruffe, L., 2009. Determinants of technical efficiency of Slovenian farms. Post-Communist Economies 21(1), 117-124.
- [4]Cofas Elena, Toma Elena, Dumitru Sorina, 2012, Statistical macro regional analysis for vegetal agricultural production sector, Conferința Științifică Internațională "Eco-Trend", House Publisher Academica Brâncuși, 310-316.
- [5] Ikerd JE, 1993, The need for a systems approach to sustainable agriculture, Agriculture, Ecosystems and Environment 46 (1-4): 147-160
- [6] Luca, L., Alexandri, C., & Grodea, M. (2010). The adjustment factors of the dairy farm sub-sector in Romania, Revista Lucrari Științifice Seria Agronomie/Scientific Papers Journal Agronomy Series (USAMV Iasi), 53(11): 371-376
- [7]Toma Elena, 2010, Farm efficiency analysis in Romania using FADN methodology, Scientific Papers "Management, Economic Engineering in Agriculture and Rural Development", 10(3)/2010:333-336
- [8] Vlad Mihaela Cristina, Toma Elena, Forecast the impact on producers and consumers Common Agricultural Policy mechanism, The 7th International Conference "Integrated Systems for Agri-Food Production – FOOD & ENERGY for XXI Century", SIPA'11, Nyiregyhaza, Hungary, 10-12 November 2011, Ed. Eurostampa Timișoara, pg. 374-378
- [9]European Commission, Directorate-General for Agriculture and Rural Development, EU Dairy Farms Report 2012, available online at http://ec.europa.eu/agriculture/rca/pdf/Dairy_report_2012.pdf
- [10]European Commission, Directorate-General for Agriculture and Rural Development, L.3 Microeconomic analysis of EU agricultural holdings – Eu Farm economics overview – Report 2005

VALACHIAN CORKSCREW HORNS SHEEP BREED (“RATSCA”) - A HISTORICAL DOCUMENT

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Abstract

Corkscrew horns Valachian sheep is a breed from the Early Egyptian (Ovis paleoegyptica) philetic group, located in Serbia, Montenegro, Panonia, and Romanian border with Serbia. The tribe was named by Buffon (1780), Darwin (1865) Valachian, by Serbs Corkscrew Horns Valachian (Valaska vitorogta), by Hungarian Racka (=Serbian), by Linnaeus O.a.strepsiceros. The translation of strepsiceros into German=Zackel (Nathusius 1890), produced a confusion with the Valachian philetic group descending from the Thrakian philetic group. To avoid confusion, we proposed (1994) to use for this philetic group the Serbian name Valachian Corkscrew Horns. It is a sedentary sheep, not adapted to transhumance and large flocks, it does not support wintering in open field, even to stay in the rain. It has a smaller weight of fine fibbers in the mixed wool, it seems that its black colour is recessive, reverse than in Valachia (Tsurcana) breeds. It is economically not competitive with other local and improved breeds and it is in danger of extinction in Serbia and even Romania and well conserved in Hungary. It was considered as a historical document (Dunka 1984) and perhaps it is. It is a proof for the former existence of a Valachian tribe in this area, implicit for the Valachian contribution to the ethno genesis of nations in this region. As an interesting genetic resource, but also for the aesthetic aspect of its horns and for some cultural reasons, it deserves to have a good genetic conservation programme.

Key words: ethno genesis, historical document, Valachian Corkscrew horns sheep, Montenegro, Panonia, Romania, Serbia

INTRODUCTION

The Valachian Corkscrew Horns sheep breeds, was first presented by Buffon (1780), after a description of Colinson, under the name Valchian (“*Brebis valachienne*”). Colinson noticed it in the former Yugoslavian space, being perhaps the sheep of some Valachs (Romanians).



Photo 1. The Valachian Corkscrew Horns sheep

Interesting by their spectacular horns, similar to the former antiques Egyptian sheep, the breed looked like in the photo presented on

the web site

(<http://nelucruciun.wordpress.com/2012/10/14/un-brand-pierdut/>) (Photo 1) and named Valachian by many 19-th centuries scientists, including Ch. Darwin (1865). Linnaeus named this breed *Ovis aries strepsiceros*.

The Serbs denominate this breed Valalachian Corkscrew Horns (“*Valaska vitoroga*”). To avoid a confusion with others breeds named also Valachian, we recommended (1994), (in spite of Taxonomically reglementation who do not allow the change of name), the utilisation of the Serb name. The Hungarian name of the breed was “*Racka*”, not noticing that that mean “Serbian”(Raks=Serb). The Romanian scientists accepted the Hungarian name “Ratska”), some scientist (Maior-1899), understanding that this means “Serbian”. Cornevin (1890) presented the Corkscrew breed as “from Montenegro”. Nathusius (1880) translated the Linnaeus strepsiceros into German and denominated the breed *Zackel*,

and this name was extended to all the Valachian sheep breeds even they were not related to Corkscrew Horns Valachian.

From this introductory notes, it is obviously that in the Corkscrew horns Valachian breed denomination, even in its classification, identification as in the whole farm animals taxonomy, many errors persist having a negative economical and historic-cultural effect; it is a whole comedy of errors (Draganescu 1998). By studying the breeds from this part of Europe, and the Zoological Taxonomy, we proposed some improvement in the Farm Animal Taxonomy especially accepting some reglementations of Zoological Taxonomy.

*We note that naturalists, such **Buffon and Linnaeus**, established valid systems of identification, classification and nomenclature for the extraordinary diversity of plant and animal species, a common language for all biologists. Linnaeus tried also to put in order the kingdom of domestic animals. He utilized for the sheep breeds a binary denomination (*O. aries: rustica, hispanica, anglica, policerata, africana, laticauda guinesis, strepsiceros*). **The great diversity of domestic animals, the lack of clear and satisfactory criteria for classification did not give Linnaeus and the 19th century scientists the possibility to solve the problem. Mason (1951, 1969, 1988, 1999) noticed the possibility of “the confusions which can arise by some breeds having entirely different name in different parts of the world”.** He considered the necessity of classification, but because “comparable information about all breeds was hard to be obtained”, his “work has remained at the stage of dictionary”. The breed inventory made by EAAP and FAO tried to clarify some problems but many taxonomic confusions persists.*

The objective of this paper was at first sight to illustrate and correct some taxonomical deficiencies connected with this breed (nomenclature, description classification). During the researches, also some interesting cultural aspects have appeared. Our research work considered the breed from all the four European locations and the valuable and good description made by Bodo for the Corkscrew

horns breed from Hungary, and added just some modest remarks on this breed in Romania.

MATERIALS AND METHODS

The research started in years 1994 reading the Dunka Bela brochure, the Nathusius book and visiting the Hungarian Racka Sheep Hortobagy Nemzeti Park reservation. Then continuing the documentation and paying visits and making studies on Corkscrew horn peasants' micro-farms in Romania (Banat -some 5 villages in Dogneci Mountainous area, near the Roman-Serb border), the author tried to see the breed in Serbia. At the Romanian Caransebes Experimental Station, it was established a small nucleus of this breed and there were presented the observations in some papers, most of them not published.

RESULTS AND DISCUSSIONS

I. Origin and classification

(1) **For the origin** of Valachian Corkscrew Horns sheep there are two suppositions.

(a). **The first supposition** resulted from the first name, given by Buffon and maintained practically by all scientists of the 18-th, 19-th even the 20-th century, starting with Colinson-Buffon, Darwin. This name pointed out that this sheep has been the sheep of some Valachian tribes. It is about the Romanians, the term of Valachs being the nickname given to Romanians after the change of the power and the language in Constantinople from Latin to Greek (in the year 641). The name given by the Serbs (Valaska vitoroga), by the Hungarians, German Romanians from Romania (Racka, Serbian) and by Cornevin (1890) pointed out that the breed owners, called Valachians, have been from the Serbo- Montenegro, the Panonian space. Most of the breed was brought there before the migration period, during the Romans era, from the Middle East. The Thrako-Geto-Dacs, the main ancestors of the Valachians had not such sheep.

The supposition is attested by Ryder and Stephenson (1968), quoted also by Vicovan (2006), who investigated the old origin of Corkscrew horns Valachian sheep and found

that there were two old sheep with such horns:
 (1).About 5000 years ago, the sheep lived in Mesopotamia (present Iran), of which just the rams had corkscrew horns;

(2).In the same period of time, in Egypt, there were corkscrew horned sheep in case of the both sexes. Ryder noted that the Valachian Corkscrew Horns sheep reminded of the Egyptian sheep, although there were some differences between them. The Egyptian sheep had loped ears, short wool and long feet.

(b).**The second supposition** was made and accepted by some Hungarian scientists. In Dunka's opinion (1984), the breed "*found its way into the Carpathian basin during the great migrations, arriving either with the conquering Hungarians or other people and tribes*". As an evidence for his supposition, he discussed about a similar Moldavian or Russian Racka, but such sheep did not exist there. Bela Dunka (1984) also indicated that "the breed is primarily indigenous to the Hungarian Plain." He was right, because Cavalli-Sforza (2001) suggested an old "local Romance-speaking population in that area" before the conquest and language imposition by the Magyar monarchy." And it was possible, but less probable, that the Romance speaking population had the Corkscrew Horns sheep.

Kukovics (2005) sustained Dunka's opinions, affirming that the Whit Racka had an "Asian origin, and arrived in Europe with the Hungarian people in the 9th century, according to most of the opinions " (p.210). For the Black Racka, he accepted however that just "several opinions arrived in Europe with the Hungarian

people in the 9th century"(p 208). Perhaps the last affirmation was true. The thesis was used to re vindicate some territories. Not taking into consideration the scientific true, underlined by Sforza-2001, that Hungarians were genetically just 10 % Magyars, imposing their language to the former inhabitants of the Panonian Roman province, one could suppose that the Valachs, who came in Transilvania just in the 13th century, replaced the Magyar Racka with their Tsurcana and Tsigai sheep brought from the Balkan area. The last opinion, belonging to Kukovics and attested by the fact that at an exhibition in Utrech (in 1996), the breed was denominated by the Hungarians who exposed "Racka or Valache"(Photo 1), and noticed that it was of Romanian origin. We have to mention an additional aspect of this problem. Baltay (1994) stated that the breed was the most important breed in Hungary till the 17-th century, but Bokony mentioned that archaeologically, it appeared just in the 17-th century. As a curiosity, we note also that in 2000 edition of FAO WWL III the Valachian Corkscrew Horn (Serbian) was denominated "Zackel vitoroga".

Perhaps it will be useful from a taxonomical point of view, if in Romania and Hungary it will be adapted the Valachian Corkscrew Horns denomination and clarified the denomination in Montenegro-Kosovo and the NE Africa.

(2)**Classification.** Deduced from the presented considerations, the suggested phylogenetic classifications of the breeds from this phyletic group are presented in Fig.1.

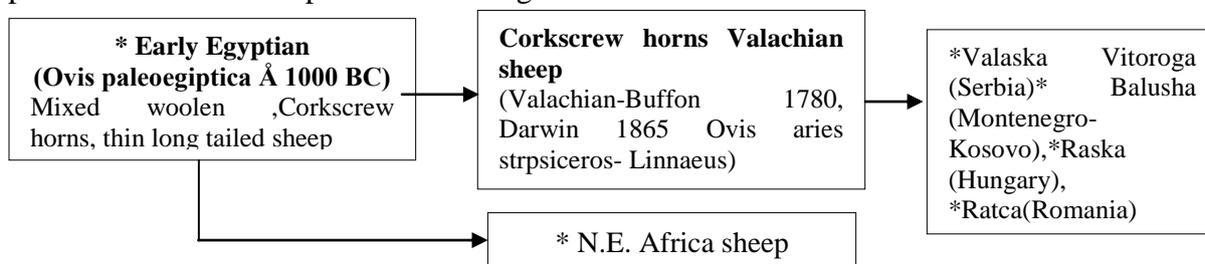


Fig.1.Suggested cladogram of Corkscrew horn Valachian sheep (Drăgănescu1998, Reader 1968)

(3)**Classification error.** Erroneously the breed was and still is included in the Zackel phyletic group, even the name Zackel is not used in any country for any breed. The

explain of this situation is the following one: Nathusius (1880) made a history of identification and breed denomination. He translated the breed Linnaeus name-O. a.

strepticeros -into German, and named it "Zackel" referring to its straight horns (strepsiceros="prong"-Eng.="zackel"-Germ. as Mason deduced). Nathusius's innovation (1880) created the error: the denomination of all breeds named, even at present, Valachian (Valakhskaia, Valassky, Zoslachtena Valaska, Walachenschaf, Vlahikos, etc.) Zackel. It was possible that the error was determined by the fact that the term of "Zackel" used by the Germans from Romania, referred to the "mountain peasants", and the mountain peasants were the Valachians. As a result, all the Valachians' breeds were named "Zackel" by the German scientists, even though these breeds had their origin in the Thracko-Geto-Dacic sheep, introduced about 1000 years B.C. from Mesopotamia, not related with the corkscrew horns sheep. This error can be justified by the fact that the both groups of sheep had a greasy wool, confusion could be possible. Scientifically, the confusion can produce some elementary errors. The typical Valachian breed ("Tsurcana of Ghimes") is denominated "Gymes Racka", even though it has nothing in common with the corkscrew sheep which is not adapted to live in such an area (Gymes area).

II. Location and nombet of breed in Romania

In 1997, we noted the location of the breed in the **Romanian** Caras-Severin (Banat region) department, the Dognecea mountain area ("Carasana area"), about 20-50 km of the Romano-Serbian border, in 4 villages (Binis, Comorâște, Forotic, and Doclin). There were 209 females and 18 males with clear known pure breed origin in 22 subsistence farms. Also, there were indicated 671 females and 28 rams with not clear origin in other 35 farms.

In 1999, in Romania, it was statistically confirmed a number of 2,058 sheep in all the areas. Vicovan (2006) estimated an effective size (Ne) of 160,1 animals, a critical situation of for breed in danger. From this area, the breed sample was exported in the 1960s' in Hungary.

In **Hungary**, the breed was well preserved, selected and presented (Bodo 1996).

In the period 2002-2003, the production live stock was represented by 1,300 black sheep

and 10,000 white sheep. In 2005, the registered live stock was 2,400 white Racka sheep in 30 farms and 1,450 black Racka in 35 farms. The production system was a traditional extensive one (Kukovics).

The main production characteristics of the breed were the following ones: prolificacy 1.1-1.2; weight gain 220-240 g/day/ewe and 250-300 g/day/ ram; body weight at the age of 1 year: 30-34 kg for ewes and 42-46 kg for rams; body weight developed by adults: 40-44 kg for ewes, and 50-55 kg for rams (in the traditional extensive production system in ecofarms); greasy wool weight 2,0-3,0 kg/ewe, 24-32 microns fineness, 14-27 cm length.

It seems that, in **Serbia**, the breed disappeared or it is critical endangered (about 6 sheep in 1999 ?)

III. Some morpho-physiological features of the Valachian Corkscrew horns sheep

As now the breed is erroneously and frequently included in the Valachian sheep philetic group ("Zackel"), it is important to study the similarities and differences with it.

At a superficial observation, it seems that the only or the major difference between the Corkscrew horns Walachian sheep and the classical Walachian sheep ("Tsurcana"), erroneously named Zackel sheep, are the horns.

The differences are much more complicated indeed. The Corkscrew sheep is a sedentary sheep (not adapted to transhumance, and big flocks, requiring shelters (because it is not able to support wintering in the open field, even in the rain). One explanation of these differences between these philes is the smaller weight of fine fibres in the Corkscrew horns sheep, and as a consequence, less resistance to cold and even rains (Table 1)

The breed is used for milk, lamb meet and wool production. There are not too many research works on its production trait. A comparative study on Tsurcana breed (Saurer 1999) mentioned that the live weight of the Romanian Corkscrew horn sheep is 50.15 kg (Caransebes Tsurcana 46.43 kg—the difference is not significant), wool production 1.44 kg (Tsurcana 2.45 kg), washed wool proportion 75% (Tsurcana 68.2%), milk fat 6.4%

(Tsurcana 7.2%), milk protein 6.15% (Tsurcana 5.75%), wool length 28.2 cm (Tsurcana 26.4 cm), finesse 38.11 microns (Tsurcana 40.5 microns). This data are confirmed by some earlier research results (Table 2, Stefănescu 1956).

Table 1. Percent of different wool fiber in Corkscrew horns and Tsurcana (Stefănescu *et al.*, 1958)

Breed	Fiber type		
	Fine (18-30 microns)	Medium (30-45 microns)	Coarse (45 microns)
Corkscrew horns	34.95	40.68	24.37
Tsurcana	55.02	24.36	16.62

Table 2. Wool and milk production of Corkscrew horns Valachian and Tsurcana (Stefănescu *et al.*, 1958)

Breed	Wool production			Milk production (kg)				Lactation (days)	
	No.ind.	Average (kg)	Limits (kg)	No.ind.	Average	Limits	% fat	Average	limits
Corkscrew Horns	20	1.8	1.5-3.9	22	134.13	23.84- 269.29	7.05 (5.9- 8.2)	161.12	138- 177
Tsurcana	216	2.06	1.2-4	-	-	-	-	-	-



Photo 2. A ram, the Shepard and the researchers in the Romanian Dogneciu area

In Romania, there are not enough scientific research works on the morphological aspects of the breed. It is not yet clear, but it seems that in Corkscrew Valachian sheep the black color is recessive, reverse as Tsurcana breed (Valachian, Zackel). It seems that its conformation and development is not too different compared to the Hungarian Corkscrew sheep, frequently presented in literature (Bodo 1996), although the last one is better selected and more uniform in development and conformation. There are also differences regarding the position of the horns (just uniform straight V twisted horns in the Hungarian sheep, the Romanian one has also lateral straight horns) and the Hungarian

is more uniformly coloured (white wool, reddish face and legs, or black wool, face and legs). More details connected to the morpho-productive characters of the breeds are presented in the questionnaires for the European Regional Focal Point for Animal Genetic Resources (Draganescu. Kukovics 2005)V.

IV. Production system, genetic management

Most of sheep from the Romanian breeding area belong to the subsistence farms, raising 1-20 ewes each. The sheep are pastured around the village, the owners being associated and organizing flocks of about 100 sheep; in the morning and in the evening, each owner uses to milk his sheep at home.

Generally, each owner uses to keep rams and in Romania, a classic community breeding system is applied meaning that flocks are the object of exchange between owners conveniently. However, there are some elite flocks, where the breeder produces rams, practicing some inbreeding.

Conservation. After the forced introduction of Tsurcana sheep in the co-operative farms (1950-1970), from the Corkscrew horns Valachian area, the owners noticed that the Tsurcana-the Romanian Valachian has some advantages. As a result, although the breed is still used for milk, lamb meet and wool production, it is in a critical danger of

extinction like in Serbia. By tradition, some peasants still conserve it for a short period, but this is not a solution. Besides the necessary scientific approach in the breed diagnosis and in the establishment of its genetic and cultural importance, a program of official preservation should be introduced. The Hungarian example and practice could be very useful.

CONCLUSIONS

Corkscrew horns Valachian sheep is an important old sheep breed located in Serbia, Montenegro, Panonia, and the Romanian border with Serbia. It is a sedentary sheep, not adapted to transhumance and to large flocks, it is not able to support wintering in open field, and even to stay in the rain. It has a smaller weight of fine fibers in the mixed wool, and its black colour seems to be recessive, reverse than in case of the Valachian (Tsurcana) breeds.

Corkscrew horns Valachian sheep is not competitive from an economic point of view with other local and improved breeds, it has to be considered a genetical resource of genes and a proof of the existence of the old populations and creation of the nations in this region. Also, it is in danger of extinction in Serbia and even in Romania, but it is well preserved in Hungary.

Corkscrew horns Valachian sheep is considered to be a historical document regarding the former existence of a Valachian tribe in this area, and for the Valachian contribution to the ethno genesis of the nations in this region. As an interesting genetic resource, but also for the aesthetic aspect of its horns and for some cultural reasons, Corkscrew horns Valachian sheep deserves to have a good genetic conservation programme.

REFERENCES

[1]Baconyi, S, 1974, History of domestic mammals in the Central and Eastern Europe, Akad Klado, Budapest
 [2]Bodo, I., 1944, The Hungarian Racka, *AGRI* 13: 83-91
 [3]Darwin, C., 1865, The variation of animals and plants under Domestication

[4]Draganescu, C., 1994, An attempt to a Phyletic classification of the Valachian and Tsigai breeds, *Stocarstvo*, 48:9-19:395-401
 [5]Draganescu, C., 1995, Origin and relationship between the Valachian and the Tsigai breeds from the Danubian area. *Stocarstvo*, 49:9-10:321-327
 [6]Drăgănescu, C., 1997, Note on the Corkscrew Horns Sheep Name, Dagine, International Symposium, Naples. EAAP Publication, 85:101-106
 [7]Draganescu, C., 1998, The Buffon Valachian sheep. Book of abstracts, EAAP, The 49th meeting. S2.33
 [8]Drăgănescu C, 1997, Sheep breeds from the Central, Eastern and Southern Europe-Points of reference in the history of the Romanians. Romanian Academy. Studies of Economic History. III. Academy Publishing House.
 [9]Draganescu, C., 2001, An attempt to a phyletic classification of the Balkan Native Breeds, Tekirdag, Turkey
 [10]Draganescu, C., 2003, Romanian strategy for the management of AnGR, Bucharest 9
 [11]Draganescu, C., 2005, Corkscrew Horns Valachian Breed in: Possible way of conservation, RFP EURPE (Questionnaire)
 [12]Dunka, B, 1984, a Magyar Racka (The Hungarian Racka), Hortobagyi Nemzet Park, Debrecen, Hungary
 [13]Kukovics, S, 2005, Hortobagyi Racka Black variant (pp.208-209) and white variant (pp.210-211) in: Possible way of conservation, RFP EURPE (Questionnaire)
 [13]Mason, I.L., 1988, World Dictionary of Livestock Breeds, CAB Int.
 [15]Nathusius, H.V., 1890, Vortrage uber Schafzucht p. 396-398, 201. Berlin Wiegendt
 [16]Rider, M.L., Stephenson, S.K., 1968, Wool Growth. Acad. Press London. New York
 [17]Sauer, I. *et al.*, 1999, Study of the morpho-productive parameters for the Ratca Breed
 [18]Ștefănescu, C., Angelescu, L., Taftă, V., Trifu, G. 1958, Experimental results on G2 Merinos xTsurcana Crossbreds (White and Ratsca varieties), *Annals of Institute for Zootechnical Research*, XV:298-319
 [19]Teodoreanu, N., Derlogea, V., Ștefănescu, C. 1952, Research on wool characteristics of the G1 Merinos xTsurcana crossbreds, Ratsca variety, *Com.Acad.* II:7-8
 [20]Vicovan, G., Vicovan, A., Radu, R. 2006, The Corkscrew Horns Valachian Breed, in: Evaluation of risk status, *Europolis Publishing House, Constanta*, 99-104
 [21]FAO WWL III Ed., 2000
 [22]Draganescu, C., 2004, The Valachian Corkscrew Horns Sheep Breed (Ratsca), The 33rd Session of International Scientific Communications, University of Agricultural Sciences and Veterinary Medicine Bucharest, 25-26 November, 2004
 [23]Draganescu, C., 2005, The Valachian Corkscrew Horns Sheep Breed (Ratsca)-a new approach, *Scientific Papers Animal Science, Series D*, vol. XLVIII:11-16/2005
 [24]<http://nelucraciun.wordpress.com/2012/10/14/un-brand-pierdut>

ECONOMIC EVALUATION OF AGRICULTURAL LAND IN THE TOWN COVACI, TIMIS COUNTY

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Abstract

The goal of the present paper is to get information concerning the technical and fertility features of agricultural lands to be able to determine their present general production capacity in different crops and, implicitly, the uses that underlies technically and scientifically the most proper practical measures of rational use and conservation of the land for the benefit of the specialists. We focussed in the present study on the lands belonging to the cadastral territory of the commune of Covaci (Timiș County), i.e. the soil types identified within this perimeter. They are studied in relation to environmental factors that impact them and making up, with them, homogeneous ecological territory units with specific suitability for different agricultural or forestry uses and with different improvement requirements and technologies. The goals were: - characterising the natural framework; -identifying and characterising soil types and subtypes; -calculating land assessment grades; establishing suitability and classifying agricultural lands into fertility classes.

Key words: *fertility, improvement requirements and technologies, soil*

INTRODUCTION

Covaci (Hungarian *Temeskovácsi*, German *Kowatschi*) is a locality in the Timiș County, Banat, Romania. It is part of the Commune of Sânandrei. Due to its suitable location (north from Timisoara), it is positively impacted both economically and socially (urbanistic development, population growth). Covaci is located 45°49'53" North latitude and 21°13'41" East longitude, in the south of the Western Plain (Timișului Plain) [6]. It is 7 km north from Timisoara and 3 km North-East from the closest locality, the village of Cerneteaz.



Fig.1.Geographical position of Covaci locality in Timis County

The climate is a moderate temperate-continental one; the soil is relatively fertile, and the flora and fauna are typical to the plain area and include forested areas. North from Covaci there is the Beregsău rivulet; in the past, the Bega Veche River would flow south from Covaci, but it has dried. West from Covaci, there passes the European Road E671 (overlapping the National Road DN69), to which it connects through the Communal Road DC58 that goes to Cerneteaz. The village of Covaci is located in the central part of the Western Plain, in the southern part of the Vingăi Plain, 89 m above sea level. The soils in the locality belong to the gley soil, mollic preluvosoil, and mollic-reddish preluvosoil types. [11]

MATERIALS AND METHODS

Assessing agricultural lands is a complex operation aiming at the deep knowledge of the plants' growth and development conditions and at determining the suitability degree of these conditions for each use and crop (given that a land can be suitable for certain uses and

crops, but unsuitable for others) through a system of technical indices and land assessment grades [3]. As such, land assessment determines how much better a land is compared to other ones taking into account its fertility as shown by the vegetal production. [5]

The object of land assessment is land that is to be divided so that each area taken into account is as homogeneous as possible from the point of view of all environmental conditions and vegetation factors. These land parcels are called land units (LU) or homogeneous ecological lands (HEL), and they represent the basic units of the land with their specific features, distinct from the neighbouring areas. [10]

For the calculus of land assessment grades we have chosen, from the multitude of environmental conditions, only those that characterise each land unit in our soil study, the most important ones for us, the easiest and the most accurate to measure, and the ones that are usually mentioned in literature (e.g., those that are mentioned in the research carried out by the OSPA – Timiș starting with 1976); these land assessment indices are: index 3. C – mean annual temperatures – corrected values; index 4. C – mean annual rainfalls – corrected values; index 14. – gleysation; index 15. – pseudo-gleysation; index 16 or 17 – salinisation or alkalisation; index 23. A – texture of Ap in the first 20 cm; index 29 – pollution; index 33 – slope; index 38 – land gliding; index 39 – depth of water table; index 40 – liability to inundation; index 44 – total porosity in the restrictive horizon; index 61 – contents of total CaCO₃ within 0-50 cm; index 63 – Ap reaction in the first 20 cm; index 69 – base saturation level in the Ap or within 0-20 cm; index 133 – edaphic volume; index 144 – humus supply within 0-50 cm; index 181 – stagnant (surface) moisture excess. [1]

In land assessment for natural conditions, each of these indices – except for index 69, which cooperates indirectly – contributes to the land assessment grade through a land assessment coefficient ranging between 0 and 1, depending on the feature (totally unsuitable

or optimal) for the use of crop taken into account). [4]

For each index, depending on its scale of use or crop, we designed tables containing their values.

RESULTS AND DISCUSSIONS

The main physical-mechanical, physical and chemical hydro Gley soil, sandy loam-East /, sandy loam-East on discontinuous medium fluvial material Covaci village, Timis.

The texture is sandy loam medium (SM) from 0-40 cm, loamy medium (MM) between 40-9100 cm;

The total porosity values between 0-22 cm high, medium values between 22-40 cm, low between 40-60 cm;

Field capacity (CC), the average values from 0 to -60 cm;

Wilting coefficient (CO) shows low values between 0-60 cm;

Density (DA) shows very low values between 0-9 cm, small between 9-22 cm, average values between 22-40 cm, 40-60 cm high values;

Soil reaction is slightly acid between 0-60 cm, neutral between 60-100 cm;

The content of calcium carbonate CaCO₃ is absent from 0-100 cm;

Supply of humus in the top 50 cm the average values;

Ao nitrogen index has a good supply condition;

Content Ao P assimilate supply the poor condition;

Content Ao K assimilate supply has a very poor condition.

The main physical-mechanical, physical and chemical hydro preluvosoil softness, medium clay loam / clay loam medium on fine discontinuous eluvial material from Covaci village, Timis.

Average texture is clay loam (TT) between 0-66 cm, clay-clay-powder (TP) between 66-92 cm, clay-silty (AP) between 92-125 cm;

The total porosity values between 0-25 cm high, small between 25-125 cm;

Field capacity (CC), the average values from 0 to -66 cm;

Wilting coefficient (CO) shows high values between 0-66 cm;

Density (DA) shows low values between 0-25 cm high values between 25-125 cm;

Soil reaction is slightly acid between 0-35 cm, neutral between 35-125 cm;

The content of calcium carbonate CaCO₃ is absent from 0-125 cm;

Supply of humus in the top 50 cm the average values;

Rate of nitrogen in the state of supply Press medium;

The content of digestible P in Ap state of supply shows a middle;

Content Ap K assimilate supply presents a middle condition.

In order to assess the production capacity of the lands studied at Covaci, we have chosen, from the environmental conditions, only 17 that we consider more relevant, and better determined.

Based on these environmental conditions and on value scales, we extracted, from the tables (annexes 3-1 to 3-18) (according to the methodology of soil studies, Part 2) land assessment coefficients that express the suitability of an index for each crop and use category of the land in discussion.

Table 1. Agricultural land assessment at Covaci (Timiș County) in winter wheat, rye, grain maize and sunflower

Soil type	Winter wheat		Rye		Grain maize		Sunflower	
	Land assessment grade	Fertility class	Land assessment grade	Fertility class	Land assessment grade	Fertility class	Land assessment grade	Fertility class
Gley soil	46	VI	46	VI	45	VI	48	VI
Molic preluvo soil	70	IV	72	III	70	IV	72	III
Reddish molic preluvo soil	70	IV	72	III	70	IV	72	III

Results are presented in detail for the different land use categories or for the crop groups with

the same biological or cultivation technologies features.

For each index, depending on its scale of use or crop, we designed tables containing the values of the coefficients.

Table 1 shows land assessment grades and fertility classes in winter wheat, rye, grain maize and sunflower.

Table 2 presents land assessment grades and fertility classes in grasslands and hay-making fields.

Table 2. Agricultural land assessment at Covaci (Timiș County) for grasslands and hay-making fields

Soil type	Grasslands		Hay-making fields	
	Land assessment grade	Fertility class	Land assessment grade	Fertility class
Gley soil	65	IV	56	V
Molic preluvo soil	72	III	72	III
Reddish molic preluvo soil	72	III	72	III

CONCLUSIONS

The village of Covaci is located in the central part of the Western Plain, in the southern part of the Vingăi Plain, 89 m above sea level. The soils in the locality belong to the gley soil, molic preluvo soil, and molic-reddish preluvo soil types.

For the calculus of land assessment grades we have chosen, from the multitude of environmental conditions, only those that characterise each land unit in our soil study, the most important ones for us, the easiest and the most accurate to measure, and the ones that are usually mentioned in literature (e.g., those that are mentioned in the research carried out by the OSPA – Timiș starting with 1976);

The soils studied at Covaci for cultivation with winter wheat, rye, grain maize and sunflower range within the fertility classes III and IV, with land assessment grade values specific to these fertility classes, i.e. 70 and 72, respectively.

Hay-making fields require more from the physical and chemical features of the gley soil, which results in a dramatic decrease of land assessment grades, ranging them in fertility classes IV and V, respectively. Molic preluvosoil and reddish molic preluvosoil have land assessment grade 72, ranging within fertility class III.

Preluvisols in agricultural use are suitable for a wide range of crops namely cereals and corn, but are used with good results in fruit growing and viticulture.

Gleiosolurile due to periodic oscillations of groundwater that adversely affect physical and chemical indicators and fertility, crop supports hard alternation of excess and lack of moisture

REFERENCES

- [1]Chirita, C.D., 1955, Pedology general agro State Publishing House, Bucharest
- [2]Duma-Copcea Anișoara, Stroia, M.S., 2007, Soil Science, Agroprint Publishing House, Timisoara
- [3]Duma-Copcea Anișoara,2012, Pedology - course materials - Agroprint Publishing House, Timișoara
- [4]Nicoleta Mateoc Sirb, 2003, Agricultural Economics, Publisher Agroprint, Timisoara
- [5]Paun Ion Otiman, Nicoleta Mateoc Sirb, Camelia Manescu, 2013, Rural Economy Mirton Publishing House, Timisoara
- [6]Stefan, V., Duma Copcea Anișoara, Mihaș Casiana, 2004, Soil, practical work Lumina, Dr. Tr Severin, Romanian
- [7]Process systems of soil classification, ICPA Bucharest, 2012.
- [8] *** Methodology for developing soil studies ASAS - I.C.P.A., Bucharest, 1987.
- [9] ***Work instructions for conditional evaluation farmland pedological background elements and technological characterization, ICPA Bucharest, 1987.
- [10] *** Romanian system of soil classification ASAS - I.C.P.A., Bucharest, 2012.
- [11]*** Pedological study to characterize technological and conditional evaluation of agricultural land, 1992.

STUDIES ON THE ECONOMIC ANALYSIS OF AGRICULTURAL LAND IN THE TOWN HALANGA COUNTY MEHEDINTI

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Abstract

The goal of the paper was to assess the production capacity of agricultural lands for rational use. This paper relies on a selective land assessment of data in literature concerning some general and particular features of the production of agricultural lands at Halânga (Mehedinți County). The mean land assessment grade thus obtained supplied general information on the suitability of the agricultural lands for different uses and on their suitability for different crops, as well as on their proper use in the production process. They are presented in tables containing data on land assessment grades per land unit, per unit, per farm, and per parcel. Since the production capacity of the lands is impacted by both natural and man-made factors, land assessment should reflect this. In managed and improved lands, the land assessment grade for natural conditions should be multiplied using the land assessment coefficients corresponding to the improvement works in discussion.

Key words: agricultural, luvosoil, production capacity, rye

INTRODUCTION

The Commune of Halânga is located in the west of the Mehedinți County, adjacent to the Municipium of Drobeta-Turnu Severin, and consists of 7 villages: Halânga, Izvoru Bârzii, Balotești, Schintiești, Schitul Topolniței, Puținei, and Râscolești. The precincts of these villages developed along the Topolniței Valley; Balotești, Izvoru Bârzii and Puținei on the left terrace of the river Topolnița, Halânga and Schintiești on the right terrace of the same river and Schitul Topolniței (Schitul de Sus) on top of a hill surmounting the river valley. [1]

The village of Halânga has the shape of an octopus; it has developed along the communal road DC7 and spread on the terrace slope on the left of the Topolnița river. There are 12 km from the commune to Drobeta-Turnu Severin, of which 5 on DC7 and 7 on DN67.

The locality was first attested in a written document issued on April 29, 1646. [4]

The village of Balotești lies along the communal road DC7, between the river Topolnița and the slope of the left terrace of the river. There are 3 km between the village and the commune centre, and 15 km between

the village and Drobeta-Turnu Severin on DC7 and DN67. The locality was first attested in a document from August 27, 1571, by Prince Alexandru II Mircea, who mentions Câmpul lui Balota. [3]

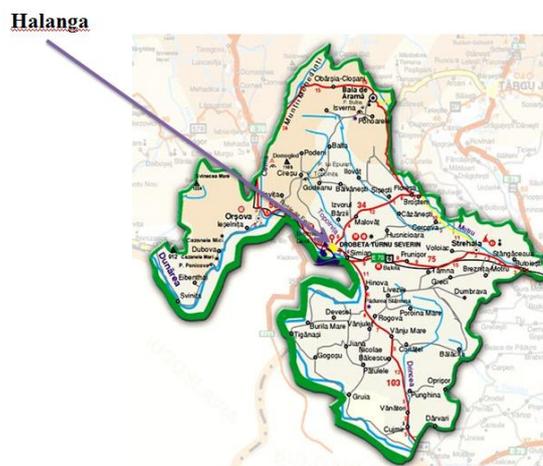


Fig.1. The geographical position of Halanga Village in Mehedinți County

The Commune of Halânga has an area of 6828 ha; it has a long shape, it goes from north to south, and it belongs to the depression of Severin. The villages have developed within the commune along the Topolnița Valley: Balotești, Izvorul Bârzii and Putinei on the left terrace of the river

Topolnița, Schinteiști on the right terrace, and Schitul Topolniței (Schitul de Sus) on top of a hill surmounting the river valley. [2]

MATERIALS AND METHODS

Assessing agricultural lands is a complex operation aiming at the deep knowledge of the plants' growth and development conditions and at determining the suitability degree of these conditions for each use and crop (given that a land can be suitable for certain uses and crops, but unsuitable for others) through a system of technical indices and land assessment grades [7]. As such, land assessment determines how much better a land is compared to other ones taking into account its fertility as shown by the vegetal production.

The object of land assessment is land that is to be divided so that each area taken into account is as homogeneous as possible from the point of view of all environmental conditions and vegetation factors. These land parcels are called land units (LU) or homogeneous ecological lands (HEL), and they represent the basic units of the land with their specific features, distinct from the neighbouring areas. [5]

For the calculus of land assessment grades we have chosen, from the multitude of environmental conditions, only those that characterise each land unit in our soil study, the most important ones for us, the easiest and the most accurate to measure, and the ones that are usually mentioned in literature (e.g., those that are mentioned in the research carried out by the OSPA – Timiș starting with 1976); these land assessment indices are: index 3. C – mean annual temperatures – corrected values; index 4. C – mean annual rainfalls – corrected values; index 14. – gleysation; index 15. – pseudo-gleysation; index 16 or 17 – salinisation or alkalinisation; index 23. A – texture of Ap in the first 20 cm; index 29 – pollution; index 33 – slope; index 38 – land gliding; index 39 – depth of water table; index 40 – liability to inundation; index 44 – total porosity in the restrictive horizon; index 61 – contents of total CaCO₃ within 0-

50 cm; index 63 – Ap reaction in the first 20 cm; index 69 – base saturation level in the Ap or within 0-20 cm; index 133 – edaphic volume; index 144 – humus supply within 0-50 cm; index 181 – stagnant (surface) moisture excess.

In land assessment for natural conditions, each of these indices – except for index 69, which cooperates indirectly – contributes to the land assessment grade through a land assessment coefficient ranging between 0 and 1, depending on the feature (totally unsuitable or optimal) for the use of crop taken into account). [6]

For each index, depending on its scale of use or crop, we designed tables containing their values. [8]

RESULTS AND DISCUSSIONS

Table 1 shows land assessment grades and fertility classes in winter wheat, rye, grain maize and sunflower.

Table 1. Agricultural land assessment at Halânga (Mehedinți County) in winter wheat, rye, grain maize and sunflower

Soil type	Winter wheat		Rye		Grain maize		Sunflower	
	Land assessment grade	Fertility class	Land assessment grade	Fertility class	Land assessment grade	Fertility class	Land assessment grade	Fertility class
Luvosoil	72	III	70	IV	72	III	70	IV

The analysis of land assessment grades in grains – winter wheat, rye, grain maize and sunflower – shows the following values: in winter wheat and grain maize, land assessment grades have values of 72 and range within fertility class III; in rye and sunflower, the land assessment grade is 70, ranging within fertility class IV.

Table 2 shows land assessment grades and fertility classes in wine grapes and table grapes.

Luvosoil ranges within fertility class IV, with values of land assessment grades of 70 in wine grapes and table grapes.

Table 2. Agricultural land assessment at Halânga (Mehedinți County) in wine grapes and table grapes

Soil type	Wine grapes		Table grapes	
	Land assessment grade	Fertility class	Land assessment grade	Fertility class
Luvosoil	70	IV	70	IV

CONCLUSIONS

The goal of the paper was to assess the production capacity of agricultural lands for rational use. This paper relies on a selective land assessment of data in literature concerning some general and particular features of the production of agricultural lands at Halânga (Mehedinți County). The mean land assessment grade thus obtained supplies general information on the suitability of the agricultural lands for different uses and on their suitability for different crops, as well as on their proper use in the production process.

The Commune of Halânga has an area of 6828 ha; it has a long shape, it goes from north to south, and it belongs to the depression of Severin. The villages have developed within the commune along the Topolnița Valley: Balotești, Izvorul Bârzii and Putinei on the left terrace of the river Topolnița, Schinteiști on the right terrace, and Schitul Topolniței (Schitul de Sus) on top of a hill surmounting the river valley.

Assessing agricultural lands is a complex operation aiming at the deep knowledge of the plants' growth and development conditions and at determining the suitability degree of these conditions for each use and crop (given that a land can be suitable for certain uses and crops, but unsuitable for others) through a system of technical indices and land assessment grades. As such, land assessment determines how much better a land is compared to other ones taking into account its fertility as shown by the vegetal production.

In land assessment for natural conditions, each of these indices – except for index 69, which cooperates indirectly – contributes to the land assessment grade through a land assessment coefficient ranging between 0 and 1, depending on the feature (totally unsuitable

or optimal) for the use of crop taken into account).

For the calculus of land assessment grades we have chosen, from the multitude of environmental conditions, only those that characterise each land unit in our soil study, the most important ones for us, the easiest and the most accurate to measure, and the ones that are usually mentioned in literature (e.g., those that are mentioned in the research carried out by the OSPA – Timiș starting with 1976);

The analysis of land assessment grades in grains – winter wheat, rye, grain maize and sunflower – shows the following values: in winter wheat and grain maize, land assessment grades have values of 72 and range within fertility class III; in rye and sunflower, the land assessment grade is 70, ranging within fertility class IV.

Luvosoil ranges within fertility class IV, with values of land assessment grades of 70 in wine grapes and table grapes.

Luvosoil in agricultural use are suitable for a wide range of crops namely cereals and corn, but are used with good results in fruit growing and viticulture.

REFERENCES

- [1] Chirita CD, Pedology general agro State Publishing House, Bucharest, 1955.
- [2] Duma-Copcea Anișoara, Stroia MS, Soil Science, Agroprint Publishing House, Timisoara, 2007.
- [3] Duma-Copcea Anișoara, Pedology - course materials - Agroprint Publishing, Timișoara, 2012.
- [4] Stefan V., Duma Copcea Anișoara, Mihut Casiana, Soil, practical work Lumina, Dr. Tr Severin, 2004. Romanian
- [5] *** Methodology for developing soil studies ASAS - I.C.P.A., Bucharest, 1987.
- [6] *** Work instructions for conditional evaluation farmland pedological background elements and technological characterization, ICPA Bucharest, 1987.
- [7] *** Romanian system of soil classification ASAS - I.C.P.A., Bucharest, 2012.
- [8] *** Pedological study to characterize technological and conditional evaluation of agricultural land, 1992.

FACTORS INFLUENCING DECISIONS FOR USING OUTSIDE FUNDS FOR FARM INVESTMENTS AND PROPRIETOR WITHDRAWALS BY SMALL-SCALE FARMERS IN ABIA STATE, NIGERIA

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Abstract

This study on factors influencing decisions for using outside funds for Farm investments and for proprietor withdrawals was carried out among rural small-scale farm households in Abia state, Nigeria. A cross-sectional survey of ninety (90) rural farm households of multi-type (varied) enterprises was carried out using cluster random sampling technique in three communities, each chosen from one of the three agricultural zones of the state. Results indicated rural household level variables that positively influenced decisions to source farm investment fund to include level of education, gender, membership of cooperative society, interest charge, land acquisition method, and ease of getting loan. Other factors that negatively influenced decisions include farming as major occupation, household savings, household size, and distance of farmers' home to source of credit. Proprietor withdrawal decisions were positively influenced by household level variables like taking farming as major occupation, payment of school fees for children of farmers, and amount of credit so far repaid by a farm household. Other factors namely household size, being member of cooperative society or savings group, interest charges on loan, off-farm income, and household savings had negative influences on proprietor withdrawal decisions. We recommended that small-scale farmers should not borrow their start-up capital from outside their households but as their farm businesses stabilize, they could decide to take loans from outside to cover their working capital and/or expand their farms and be prepared to repay such loans according to contractual agreements.

Key words: farm investment, outside funds, own funds, proprietor withdrawal decisions

INTRODUCTION

Farm investment refers to that exercise of using some finance of the present to purchase and use production resources in anticipation of recouping it in streams of income or profit in a future date. It may involve using such finances in getting some tangible structures or resources (fixed investment) or some other work-based resources intended to produce future products (inventory investment) (Arnold, 200). In Nigeria and many developing countries, small-scale farmers have reliably and dependably funded their farm projects with their own funds and retained profits from household businesses (Emerole and Ndu, 2011; Sebopetji and Belete, 2009; Asiegbu and Ebiringa, 2007; Nguyen, 2007; and Anyanwu, 2004). Such farmers have complained of denied access to loans from commercial banks on account of their

inability to provide the necessary collaterals demanded by the banks (Mbubaegbu, 2011; Osuala *et. al.*, 2012). Nigerian government since her second republic years has responded to palliating this hurdle to these small-scale farmers by instituting development bank-Nigerian Agricultural and Cooperative Bank (NACB) in 1972, which extended loans to both small and large scale farmers; agricultural lending risks reduction schemes-Agricultural Credit Guarantee Scheme Fund (ACGSF) in 1978 by which the Central Bank of Nigeria (CBN) guaranteed loans extended by Commercial banks up to 75.0% in case of any default in borrowers repayments; proximity enhancing scheme- rural banking system of 1977 by which commercial banks were required to establish some given number of rural branches; liberal economic policies such as setting up of Peoples' Bank (PB) of

1989 to cater for poor borrowers, Community Banks (CB) of 1990s; merger and reform policies-merging Peoples' bank with NACB and the risk assets of the Family Economic Advancement Programme (FEAP) to form Nigerian Agricultural Cooperatives and Rural Development Bank (NACRDB) in 2000; licensing and renaming of CB to Microfinance Institutions (MFIs) in 2005 which currently has been renamed Bank of Agriculture (BOA).

In spite of these efforts, analysts have reported poor repayment of borrowed and invested funds by farmers under different loan schemes (Njoku and Nzenwa, 1990; Njoku and Odii, 1991; Njoku and Obasi, 1991; Oke, *et. al.*, 2007). Among reasons advanced for the poor repayment of borrowed funds are loan diversions, poverty, social expenses (on ceremonies, social clubs, religious obligations, extended family) (Oke *et. al.*, 2007) and using of loans to fund family consumption expenditures (Ogunfowora, *et. al.* 1972). Funds borrowed from outside sources by farmers include those formal and informal credit facilities outside the farmer's personal savings invested in farm activities. In Abia state and in other states of Nigeria, formal credit sources include Commercial banks, BOA, government farm credit corporations and MFIs with the informal credit-giving units including Cooperative societies, farmers savings groups, traditional farmers associations, friends/relatives, and money lenders (Adebayo and Adeola, 2008). To determine actual factors that influence use of these funds sourced from outside a farmer's savings, this study had its specific objectives to: (i) describe household level socio-economic of beneficiaries of loans for farm investments ; (ii) determine factors that influenced decision to source credit for investing in small farm enterprises; (iii) analyze farm investment fund (credit) uses by types; and (iv) determine factors that influenced decisions of heads of farm households to withdraw part of borrowed funds to fund consumption expenditures or fund other investments.

MATERIALS AND METHODS

Study Area.

This study was conducted in Abia State, Nigeria. This state is one of the south-eastern states of Nigeria lying between longitudes $04^{\circ} 45'$ and $06^{\circ} 17'$ East of the Greenwich Meridian and latitudes $07^{\circ} 00'$ and $08^{\circ} 10'$ North of the Equator. Occupying an area of $5,833.7 \text{ Km}^2$ (ABSEEDS, 2004), Abia is located 596 Km away from Lagos and 498 Km away from Abuja, the Federal Capital Territory (ABSEEDS, 2004). The state with its administrative headquarters at Umuahia has a population of 2,833,999 consisting of 1,434,193 males and 1,399,806 females (FRN, 2007), and is made up of seventeen (17) local Government Areas (LGAs), with three Agricultural zones. The Agricultural zones are Aba, Umuahia, and Ohafia that are inhabited by about 315,910 farm households (ADP, 1995). Abia State is notable for production of tree crops like oil palm, Cocoa, Cashew, and Rubber. Livestock farming in the state produce poultry, pigs, goats, sheep and rabbits. Food crops grown in the state are Cassava, Yam, Rice, Plantain, Banana, cowpeas, vegetables, melon, pineapples and maize. The commonest farming system in Abia State agricultural zones is mixed farming with most farmers operating on scales that classify them as smallholders.

Sampling Technique and Data Collection.

The data were collected following a cross-sectional survey of ninety (90) rural farm households of multi-type (varied) enterprises using cluster random sampling technique in three rural communities, each chosen from the three agricultural zones of the state. The communities are Umuekechi-Asa from Aba zone, Nsirimo from Umuahia zone, Eluama-Isuikwuato from Ohafia zone of the State. A farm household was defined for this study in line with Anderson (2002) as an economic unit consisting of either a single person or a group of persons who live together and depend on common income and within the limits of that income, exercise choices in meeting specific objectives and where at least one member describes their major occupation

as farming. A questionnaire was administered to each chosen farm household following personal interview method by one enumerator in each agricultural zone. Three enumerators were involved in this exercise, collecting data simultaneously from farm households. Data gathered included age of head of farm household, gender, farming experience, household size, farm size, annual personal savings, level of education of household head, land acquisition methods, annual maximum time worked (hours) by hired labour, daily wage rate, number and types of livestock kept, livestock housing needed, Annual budget for livestock healthcare, annual livestock feed budget, membership of traditional savings association, interest charged on loan source, perceived ease of getting loans, and distance of loan source from farmer.

Data Analytical Techniques

A combination of statistical tools including frequency distribution, percentages, and means was used in analyzing the data collected for this study. While frequency, percentages and means were used to describe the socio-demographic characteristics of the farm households (objectives (i) and (iii)), objectives (ii) and (iv) involved limited response dependent variable which was analyzed with multiple regression probit model. Factors that determined decision to source credit for investing in small farm enterprises and factors that influenced decision of heads of farm households to withdraw part of their borrowed funds to fund consumption expenditures or fund other investments were determined with the model of limited dependent variable as introduced by Tobin (1958) and as applied by Amamiya (1981) and corrected for bias (Heckman, 1976) in selection of respondents. This probit model was stated as follows:

$$Y_{ij} = \alpha_j + \beta_j \sum_{k=1}^s H_{ijks} + \epsilon_{ij} \quad \dots (1)$$

Where the H_{ijks} are vectors of s explanatory variables of the j th household using services of borrowed funds in farm investments; Y_{ij} is

a vector of binary variables such that $Y_{ij}=1$ if the j th household employs the services of borrowed funds, and 0 otherwise. Since Y_{ij} can only assume two different values for the decisions, 1 or 0. The expected probability was defined as follows:

$$E(Y_{ij}) = E \left[\alpha_j + \beta_j \sum_{k=1}^s H_{ijks} + \epsilon_{ij} \right] \\ = \alpha_j + \beta_j \sum_{k=1}^s H_{ij} E(H_{ij}) \quad \dots (2)$$

Equation (2) defines the proportion of households with characteristics (H_{ij}) likely to influence use of the services of borrowed funds in their farm investment and the decisions of heads of farm households to withdraw part of the borrowed funds to fund consumption expenditures or fund other investments. The empirical model was specified for decision to take borrowed funds for farm investment thus:

$$EXP_{ij} = \beta_0 + \beta_1 \ln(FS_{ij}) + \beta_2 \ln(ED_{ij}) + \beta_3 \ln(OC_{ij}) + \beta_4 \ln(AC_{ij}) + \beta_5 \ln(HS_{ij}) \\ + \beta_6 \ln(SV_{ij}) + \beta_7 \ln(OF_{ij}) + \beta_8 \ln(AG_{ij}) + \beta_9 \ln(GD_{ij}) + \beta_{10} \ln(CP_{ij}) \\ + \beta_{11} \ln(DC_{ij}) + \beta_{12} \ln(TC_{ij}) + \beta_{13} \ln(LA_{ij}) + \beta_{14} \ln(EG_{ij}) + \epsilon_{ij} \quad \dots (3) \text{ and}$$

decisions of heads of farm households to withdraw part of the borrowed funds to fund consumption expenditures or fund other investments thus:

$$EXP_{ij} = \beta_0 + \beta_1 \ln(FS_{ij}) + \beta_2 \ln(ED_{ij}) + \beta_3 \ln(OC_{ij}) + \beta_4 \ln(AC_{ij}) + \beta_5 \ln(SV_{ij}) \\ + \beta_6 \ln(HS_{ij}) + \beta_7 \ln(AG_{ij}) + \beta_8 \ln(GD_{ij}) + \beta_9 \ln(CP_{ij}) + \beta_{10} \ln(SF_{ij}) \\ + \beta_{11} \ln(TC_{ij}) + \beta_{12} \ln(CR_{ij}) + \beta_{13} \ln(OF_{ij}) + \epsilon_{ij} \quad \dots (4) \text{ and}$$

Where explanatory variables (continuous and binary) are as defined in Table 1.

Table 1. Description of Variables analyzed by Probit Regression Model

Variable	Variable Type	Expected Sign Eqn. 3	Expected Sign Eqn. 4	Description of Variable
EXPij	Binary			1 if the jth household decides to take loan for farm investment; 0 if otherwise Eqn. (3); 1 if the jth household head decides to withdraw part of the loan or returns from its use to fund household consumption or other investment; 0 if otherwise eqn. (4);
FS ij	Binary	+	+	1 if size of farmland is at least 3.0 hectares or number of livestock is at least 100 heads; 0 if otherwise;
EDij	Continuous	-	-	Number of years of formal Education;
OCij	Binary	+	+	1 if household major occupation was farming; 0 if otherwise
ACij	Continuous	+	+	Amount of credit obtained for farm investment in Naira;
CRij	Continuous		+	Percentage of credit repaid;
HSij	Continuous	+	+	Household size (a single person or a group of persons living together and depending on common income and within limits of that income, exercise choices in meeting specific objectives and where at least one member describes their major occupation as farming);
AGij	Continuous	+	+	Age of head of household (years);
GDij	Binary	+	+	1 if male; 0 if otherwise;
CPij	Binary	+	-	1 if member of Cooperative Society or Farmers Savings Group; 0 if otherwise;
DCij	Continuous	-	+	Distance to formal source of farm credit in Kilometers;
TCij	Continuous	-	-	Interest charged on borrowed fund in Naira;
LAij	Binary	+	-	Method land Acquisition (1 if purchased; 0 if otherwise);
EGij	Binary	+	+	Perceived ease of getting credit (1 if Easy; 0 if otherwise);
OFij	Continuous	-	-	Annual household off-farm income in Naira;
SFij	Binary		+	Payment of children school fees (1 if yes; 0 if otherwise).
SVij	Continuous	-	-	Annual Household Savings in Naira.

The dependent variable for equation (3) is household's decision to take outside fund (loan) for farm investment as defined in equation (1); and the dependent variable for equation (4) is decision of heads of farm households to withdraw part of the borrowed funds to fund consumption expenditures or fund other investments as defined in equation (1). It was hypothesized that taking outside fund (loan) for farm investment by a household would positively be influenced by: FSij; OCij; ACij; CPij; LAij; and EGij; but would negatively be influenced by: EDij; SVij; OFij; AGij; DCij; and TCij on one side; and a farmer deciding to withdraw part of the borrowed fund to finance consumption expenditures or fund other investments would positively be influenced by: OCij; ACij; HSij; SFij; and CRij; but would negatively be

influenced by: FSij; EDij; SVij; AGij; CPij ; TCij and OFij.

RESULTS AND DISCUSSIONS

General Characteristics

The socioeconomic characteristics of sampled ninety (90) farm households in Abia State of Nigeria are as summarized in Table 2.

It revealed that farm sizes to a good proportion of the farm households (52.2%) was less than one hectare (mean 0.81ha) with only a small proportion (15.6%) cultivating more than three hectares (mean 5.12ha).

Ugwumba *et. al.*, (2010) revealed that small sizes of farms amongst smallholders in southeastern Nigeria call for some form of Integration especially to a proportion (47.62%) with some crop-livestock

integration potential. Size of households in the area skewed more (54.4%) to at most six members.

The mean size of the farm households ranged from approximately five to seventeen members.

Table 2. Socioeconomic of Farm Households Abia State Nigeria, 2011

Variable	Number	Mean of continuous Variables n=90	Percentage (%)
Annual Arable crop farm Size (Hectares)			
< 1.0	47	0.81	52.2
1.0 – 3.0	29	2.53	32.2
> 3.0	14	5.12	15.6
Household Size (Number)			
1-6	49	4.91	54.4
7-13	25	8.91	27.8
> 13	16	16.52	17.8
Education Level of Household head (Years)			
No formal Education	17	0.0	18.9
Primary Education	24	5.7	26.7
Secondary Education	30	8.4	33.3
Tertiary Education	19	21.2	21.1
Farm Investment Loans by households in Agricultural Zones (N'000)			
Aba Agric. Zone	30	30.8	33.3
Umuahia Agric. Zone	30	22.7	33.3
Ohafia Agric. Zone	30	23.2	33.3
Gender of head of Households			
Adult male	67		74.4
Adult female	23		25.6

₦150.00 ≈ US \$1.00. Source: Field Survey, 2011.

Large household sizes have negative implications on effective use of loans and their repayments (Njoku and Obasi, 1991). The formal educational attainment of heads of farm households in the area was relatively high since only 18.9% of them had no formal education. Level of formal education and literacy of a household head could influence his/her decisions on source and type of credit to use in farm operations.

Table 2 further revealed that farm households in Aba agricultural zone relatively took more farm credit (₦924, 000.00) (mean ₦30,800.00) than their colleagues in Umuahia agricultural zone (₦681, 000.00) (mean ₦22, 700.00) and Ohafia zone (₦696, 000.00) (mean ₦23, 200.00). Two factors, namely relative better soil fertility and proximity to urban market no doubt accounted for this difference of borrowing for production (risks) amongst these farmers. There are relatively more male headed farm households (74.4%) than female headed farm households (25.6%) amongst the respondents in the state.

Farm Credit Uses and Investment Types

Table 3 shows distribution of used farm investment loans households in Abia State, Nigeria.

Broadly, the study identified two types of investment spending namely fixed investments and inventory investment. The fixed investments in the farm business are the purchases of capital goods such as implements, livestock pens (houses), and farmers' new residential houses. The inventory investments are changes in farm business inventories (Arnold, 2001).

Table 3 shows that farm investments loans taken by the respondents were used more in Aba agricultural zone (₦924, 000.00) than in Ohafia agricultural zone (₦696,000) and in Umuahia agricultural zone (₦681,000.00). The items funded as fixed investments included rent paid on leased farmlands, construction of livestock pens, and purchase of farm implements.

These accounted for ₦240,000.00 in Aba agricultural zone, ₦149,000.00 in Umuahia

agricultural zone, and ₦163,000.00 in Ohafia total investment funds used in the area.

agricultural zone or cumulative 23.99% of the

Table 3. Borrowed Funds Uses by Types of Investments in Zona of Abia State, Nigeria, 2012

Agricultural zone	Farm Investment Type	Amount ₦'000	Total ₦'000
Aba	Fixed Investment:		
	Rent on leased land	92	240
	Construction of Pens	62	
	Purchase of Implements	86	
	Inventory Investment:		
	Purchase of Fertilizers	179	684
	Wages to hired labour	204	
	Seeds & planting materials	47	
	Livestock feeds	197	
	Livestock medication	57	
Sub-total		684	
		924	
Umuahia	Fixed Investment:		
	Rent on leased land	65	149
	Construction of Pens	46	
	Purchase of Implements	38	
	Inventory Investment:		
	Purchase of Fertilizers	124	532
	Wages to hired labour	168	
	Seeds & planting materials	44	
	Livestock feeds	148	
	Livestock medication	48	
Sub-total		532	
		681	
Ohafia	Fixed Investment:		
	Rent on leased land	68	163
	Construction of Pens	53	
	Purchase of Implements	42	
	Inventory Investment:		
	Purchase of Fertilizers	141	533
	Wages to hired labour	147	
	Seeds & planting materials	38	
	Livestock feeds	156	
	Livestock medication	51	
Sub-total		533	
		696	
Total			2.301
Proportions			Percentage (%)
Fixed investment			23.99
Inventory investment			76.01

₦150.00 ≈ US \$1.00. Source: Field Survey, 2011.

Items of inventory investment were purchase of fertilizers, wages to hired labour, seeds and planting materials, livestock feeds, and livestock medication. These variables accounted for ₦684,000.00 in Aba agricultural zone, ₦532,000.00 in Umuahia agricultural zone, and ₦533,000.00 in Ohafia agricultural zone or cumulative 76.01% of total investment funds used in the area.

Decision Determinants

Farm households are often confronted with challenges of making decisions between alternative choices. In the area of their finance needs, decision often revolves around using own savings to fund farm activities and investment or going out to borrow funds for investment in farming. When the later is the option, the farmer will have to decide which financial market to go and borrow funds. The first stage of this decision to take or not to take outside fund to finance farm investment is usually influenced by some factors. Table

4.0 shows estimate of some of these hypothesized factors among small-scale farmers in the study area. The table reveals ten out of fourteen variables as being statistically significant in informing this investment borrowing decisions of the farmers.

(a) Factors Influencing Decisions to Borrow fund for Farm Investment

Table 4 reveals that taking farming as major occupation, gender (being a male), belonging to cooperative society or savings group, household size, acquisition of farmland by purchase, and ease of getting farm investment

loans had positive significant influences on a farm household in deciding to take farm investment loans in Abia State, Nigeria. Having positive significant influences means that existence of these variables in the farm households strongly compelled the household to decide taking loans for investment in farm business. Male farmers had been favoured more by lenders in farm financing markets while women constitute the vulnerable gender that have enjoyed some level of social backwardness (Anjugam and Ramasamy, 2007; Hazarika, and Guha-Khasinobis, 2008).

Table 4. Maximum Likelihood Estimates of First-Stage Probit Model Explaining Household Decisions to Take Loans for Farm Investment in Abia State, Nigeria

Variable	Coefficient	Standard Error	T-statistic
FS	1.423	0.991	1.436
ED	-3.354***	0.812	-4.131
OC	0.788**	0.427	1.845
AC	0.226	0.473	0.478
SV	-0.732**	0.425	-1.722
HS	1.325**	0.645	2.054
AG	0.999	0.952	1.049
GD	0.998***	0.447	2.233
CP	0.726***	0.287	2.523
DC	-1.314**	0.661	-1.924
TC	-1.038***	0.466	-2.227
LA	3.146***	0.683	4.606
EG	4.222***	1.025	4.119
OF	-0.699	0.482	-1.490
Intercept	3.411***	0.942	3.621
Log-Likelihood ratio	77.134		
R-Squared	0.712		

Dependent variable (D) = Takes loan for farm investment, ** significant at 5.0%; *** Significant at 1.0%.

Source: Field Survey, 2011

Other factors namely, level of education of household head, amount of household savings, distance from farmers' home to source of loan, and interest charges on the loans had negative but significant influences in decisions to take farm credit in the study area. This means that the more these variables increased at the time of making this decision, the less the household were compelled to take any farm investment loans. Level of education of household head showed negative influence on decision to take farm investment loans and was in line with previous studies (Nguyen, 2007; Shah, *et. al.*, 2008).

A farm household having more savings has less urge to taking farm loans from outside. This is because the household savings can be used in self-financing of fixed investments and loans used to fund working capital. This practice of using personal or household savings to fund start-up capital helps to conjure commitment and feeling of ownership and financial discipline to a farm proprietor. Distant sources of farm credit dissuade investors from taking loans since repeated visits to such loan sources mean more expenses in transport fares and travel logistics. When a source of credit is near to a

borrower the better for him/her to access the credit; and the lender is in a better position to supervise the use of the credit (Obike, 2013). Interest charges on loans are prices paid by borrowers for using the facility. In all normal economic goods such prices are inversely related to volume of the goods (loan) and the willingness to have the facility.

Six of the above factors (level of education, gender, being member to cooperative society, interest charge, land acquisition method, and ease of getting the loan) were very highly ($p < 0.01$) significant determinants of decisions to fund farm investments with loans. The other factors (farming as major occupation, household savings, household size, and distance of farmers' home to source of credit) were significant but at a relatively lower alpha level of probability ($P < 0.05$).

(b) Factors that influenced Decision to use Loans for Consumption Expenditure or Other Investment

Proprietor withdrawal decisions are all decisions made by a proprietor against the original intention for a loan facility. These decisions have amounted to diversions in the use of farm credit (Oke *et. al.*, 2007; Ogunfowora, *et. al.* 1972). Table 5 revealed that taking farming as major occupation, payment of school fees for children of farmers, and amount of credit repaid by a

farm household positively determined proprietor withdrawal decision of small-scale farmers. Other factors such as household size, being member of cooperative society or savings group, interest charges on loan, household off-farm income, and household savings had negative influences on proprietor withdrawal decisions.

Households that took farming as their major occupation have no other source(s) of cash income especially during period between planting and harvesting and as such resort to using part of their loans to fund household consumption, pay school fees of their children, and meet other social obligations requiring cash expense. Mores so, households that have almost completed repaying their loans spend from their farm proceeds with much ease and confidence. Households that are large, and who decided to take farm loans spend quite a large portion of such loans in funding basic needs such as food, clothing, healthcare and shelter repairs.

All these factors (with positive or negative influences) were very highly significant ($P < 0.01$) in determining behavior of farm proprietor to withdrawing part of investment loans to fund family living expenses or withdrawing part of its returns to fund other non-farm investment in the study area.

Table 5. Maximum Likelihood Estimates of First-Stage Probit Model Explaining Household Head Decisions to Use Sourced Farm Loans for Consumption Expenditure/Other non-farm Investments in Abia State, Nigeria

Variable	Coefficient	Standard Error	T-statistic
FS	-1.721	0.923	-1.865
ED	-0.374	0.864	-0.433
OC	0.787***	0.329	2.392
AC	0.226	0.473	0.478
HS	-0.935***	0.374	-2.500
AG	0.999	0.952	1.049
GD	0.987	0.651	1.516
CP	-0.718***	0.287	-2.502
TC	-1.234***	0.361	-3.418
OF	-0.879***	0.312	-2.526
SF	3.247***	0.921	3.526
CR	0.874***	0.346	2.526
SV	-1.674***	0.442	-3.787
Intercept	-2.217**	0.953	-2.326
Log-Likelihood ratio	74.431		
R-Squared	0.773		

Dependent variable (D) = Use farm loan to fund household consumption/other non-farm investment,
 ** significant at 5.0%; *** Significant at 1.0%.

Source: Field Survey, 2011

CONCLUSIONS

The study allowed to draw to the following conclusions:

Household-based factors influenced decisions to borrow money to fund farm investments. Decisions to borrow to fund farm investments were very highly influenced by level of education, gender (being male), membership of cooperative society, interest charge, land acquisition method, and ease of getting loan. Other significant factors included farming as major occupation, household savings, household size, and distance of farmers' home to source of credit. Taking farming as major occupation, gender (being a male), belonging to cooperative society or savings group, household size, acquisition of farmland by purchase, and ease of getting farm investment loans had positive significant influences while the others had negative significant influences on a farm household decision to taking farm investment loans in the study area.

Proprietor withdrawal decisions were positively influenced by household level variables like taking farming as major occupation, payment of school fees for children of farmers, and amount of credit repaid by a farm household. Other factors are household size, being member of cooperative society or savings group, interest charges on loan, off-farm income, and household savings. These had negative influences on proprietor withdrawal decisions. All factors that influenced proprietor withdrawal decisions impacted very highly ($P < 0.01$).

Recommendations:

Small-scale farmers should strive to form their businesses with their personal or household savings. They should not borrow their start-up capital for investments like building initial livestock pens, purchasing of first set farm tools, small machines and starter packs from outside their households. However, as their farm businesses grow they can take loans from convenient outside sources to expand their businesses or meet their working capital needs. This practice of using personal or household savings to fund start-up capital helps to conjure commitment

and feeling of ownership and financial discipline to a farm proprietor.

To curb the ugly practice of loan diversions, farm owners should cultivate spirit of thrift, put some hours to paid off-farm works to earn additional income, and raise and manage moderate sized households. They should belong and attend to some financial management training organized by their cooperative societies.

REFERENCES

- [1] ABSEEDS, 2004, Abia State Economic Empowerment Development Strategy. P. 3. Abia Agricultural Development Programme (ADP) (1995). Village listing. Ministry of Agriculture Umuahia.
- [2] Adebayo, O.O., Adeola, R.G., 2008, Sources and Uses of Agricultural Credit by Small-scale Farmers in Surulere Local Government Area of Oyo State, Nigeria. *Anthropologist* 10(4): 313-314.
- [3] Amamiya, T., 1981, Qualitative Response Models: A Survey. *Journal of Economic Literature* (19):1483-1536.
- [4] Anderson, A., 2002, The Effect of Cash Cropping, Credit and Household Composition on Household Food Security in Southern Malawi. *African Studies Quarterly*, (6): 1-2.
- [5] Anjugam, M., Ramansamy, C, 2007. Determinants of Women's Participation in Self-Help Group (SHG)-led Microfinance Programme in Tamil Nadu, India. *Agricultural Economics Research Review* (20): 283-298.
- [6] Anyanwu, C.M., 2004. Microfinance institutions in Nigeria: Policy, Practice, and Potentials. Paper presented at the G24 Workshop on "Constraints to Growth in Sub Saharan Africa," Pretoria, South Africa, November 29-30, 2004.
- [7] Arnold, R.A., 2001, Economics. 5th edition. South-Western College Publishing, Thomson Learning. USA.
- [8] Asiegbu, B.C., Ebiringa, O.T., 2007. Impact of Agricultural Credit Guarantee Scheme Fund on the performance of Agricultural Industry in Nigeria. *International Journal of Development and Management Review*. 1: (1) 108-113.
- [9] Emerole, C.O., Ndu, I. C., 2011, Gender Factors in Capital Sourcing and Accessibility By Arable Crop Farmers in Owerri North Local Government Area of Imo State, Nigeria. *Global Approaches to Extension Practice (GAEP)* 7(2); 68-77.
- [10] FRN, 2007. Federal Republic of Nigeria Official Gazette. Legal Notice on Public Gazette Details of the Breakdown of National and State Provisional 2006 Census, Abuja No. 24. vol.9:1-7.
- [11] Hazarika, G., Guha-Khasinobis, B., 2008, Household Access to Micro Credit and Children's

Food Security in Rural Malawi: A Gender Perspective. Discussion Paper Series. IZA DP No. 3793. Forschungsinstitut zur Zukunft der Arbeit Institute for the Study of Labor.

[12] Heckman I.J., 1976M The common structure of statistical models of truncation, sample selection and limited dependent variables and a simple estimation for such models. *Ann. Eco. Soc. Measure* (5): 475-492.

[13] Mbubaegbu, K.K., 2011, Commercial Banking and Farmers investments in Umuahia North and Ikwuano Local Government Areas of Abia State: A case study of Union Bank Intervention. Unpublished B. Agric. Degree Project Submitted to Department of Agricultural Economics and Extension, Abia State University, Uturu, p. 61.

[14] Nguyen, C.H., 200, Access to Credit and Borrowing Behaviour of Rural Household in a Transition Economy. International Conference on Rural Finance Research: 'Moving Results into Policies and Practice' 19-21 March. Rome Italy p. 37.

[15] Njoku, J.E., Nzenwa, N. C., 1990, Loan Repayment and its Determinants Under the Smallholder Direct Agricultural Loan Scheme in Imo State, Nigeria. *Beit. trop. Landwirtschaft. Vet. Med.* 28(3): 247-254.

[16] Njoku, J.E., Odii, M.A.C.A., 1991, Determinants of Loan Repayment under the Special Emergency Loan Scheme (SEALS) in Nigeria. A case study of Imo State. *African Review of Money, Finance and Banking*.(1):39-52.

[17] Njoku, J.E., Obasi, P.C., 1991, Loan Repayment and its Determinants Under the Agricultural Credit Guarantee Scheme in Imo State, Nigeria. *African Review of Money, Finance and Banking* (2): 167-180.

[18] Obike, K. C., 2013, Cassava Farmers' Access to Microfinance Institutions and Their Production Performance in Abia State, Nigeria. A PhD Thesis Submitted to Department of Agricultural Economics and Extension, Abia State University, Uturu Nigeria. p.120.

[19]Ogunfowora, O., Essang, S.M., Olayide, S.O., 1972, Capital and Credit in Nigerian Agricultural Development. Nigerian Rural Development Study. Paper No. 6 University of Ibadan, Ibadan, Nigeria.

[20]Oke, J.T.O., Adeyemo, R., Agbonlahor , M.U., 2007, An Empirical Analysis of Microcredit Repayment in Southwestern Nigeria. *Humanity and Social Sciences Journal* 2(1): 63-74.

[21]Osuala, A.E., Osuji, J., Emerole, C.O., 2012, Determinants of Access of Small-scale Farmers to micro-credit from formal financial institutions in Abia State, Nigeria. *International Journal of Applied Research and Technology* Exxon Publishers 1(6):106-113.

[22]Sebopetji, T.O., Belete, A., 2009, An Application of Probit Analysis to Factors Affecting Small Scale Farmer's Decision to take Credit. A Case Study of the Greater Letaba Local Municipality in South Africa. *African Journal of Agricultural Research* 4(8): 718 – 723.

[23]Shah, R. S., Hashmi, A.A., Bukhari A.T., 2008, Determination of Credit Programme Participation and Socioeconomic Characteristics of Beneficiaries: Evidence from Sargodha Pakistan. *MFI Analysis in Pakistan*, p. 18.

[24]Tobin, J.,1958, Estimation of Relationships For Limited Dependent Variables. *Econometrica* (26):24-36.

[25]Ugwumba, C.O.A, Okoh, R.N., Ike. P.C., Nnabuife, E.L.C., Orji, E.C., 2010, Integrated Farming System and its Effect on Farm Cash Income in Awka South Agricultural zone of Anambra State, Nigeria. *American-Eurasian J. of Agric. & Environ. Sci.* 8 (1): 01-06, 2010.

PUBLIC-PRIVATE PARTNERSHIPS AS MECHANISMS FOR RISK MANAGEMENT IN THE WATER SECTOR

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Abstract

Some forms of Public Private Partnership (PPP) have been long since used in the procurement and operation of water infrastructure, as shown in the first part of the paper. The main object of the paper is to highlight the mechanisms of PPP in the water sector and to suggest that in times of economic and financial distress, when both the public sector and the private sector face additional risks and challenges, various models of PPP may be used to manage and mitigate the risks and to improve performance in providing the public services of Water Supply and Sanitation (WSS). The economic and financial risks of the WSS sector are commonly classified in two broad categories but within these broad categories there are many more specific risks. Therefore, we shall analyse some of these main risks and their potential interrelations, by employing several methodologies: literature review, case studies, performance indicators, risk matrix, analysis and synthesis. The mechanisms, features and experiences of PPP in this branch of the water sector are summarized and comparatively analysed, from the viewpoint of risk sharing, leading to some conclusions and recommendations on the opportunity and effectiveness of implementing such arrangements especially in Romania.

Key words: economic and financial mechanism, Public Private Partnership (PPP), risk, Water Supply and Sanitation (WSS)

INTRODUCTION

While in most industrial countries, the WSS services are very developed, due to heavy early investments in water infrastructure and institutions, thus requiring only renewing and improving for environmental sustainability, in developing and emerging countries the main challenge is investment in new infrastructure [1]. Still, all these countries share the financial need to maintain and improve infrastructure and to construct new works, seeking capital and management capacity from the private sector.

As we mentioned in a recent paper [2] some important trends have occurred in the EU water sector, mainly driven by the European Water Framework Directive 2000/60/EC. Since we have dealt first with water demand management and regionalization of water

utilities, we would like to consider another trend: privatization of the water companies' management and creation of a competitive market in the water supply and sanitation (WSS) industry.

Improving the delivery and coverage of WSS utilities is a critical need for the emerging economies and the new EU member states, in order to be able to comply with the Water Directives.

However, due to the incapacity or the unwillingness to acknowledge water as a finite natural resource and an economic good – a commodity that needs a market price reflecting the cost of provision and its true value to society [3], public water systems are often operated inefficiently and services are unreliable, lacking coverage, regular maintenance and good design. Therefore, in the long run, regional and local governments

(public authorities) should consider, for developing and delivering WSS infrastructure and utilities, the potential involvement of some private sector partners who might be able to offer increased access to their: private investment funds; improved and innovation management systems, technologies and techniques.

Nevertheless, the Public-Private Partnerships in the WSS sector may also involve some obstacles and shortcomings and may not easily take all the risks featured by the sector; still, they should be encouraged as means to develop the WSS network and service quality, compliance and coverage as well as to relaunch the local economy and to reduce unemployment.

MATERIALS AND METHODS

After presenting a theoretical and historical background of the PPP concept applied in the water sector, economic and financial risks of the WSS sector are classified in two common broad categories but also with a view of the more specific risks falling within these broad categories.

To highlight the mechanisms of sharing and transferring the risks in different PPP arrangements, we exemplify and analyse some of these main arrangements, with their risks and their potential interrelations, by employing several methodologies: literature review, case studies, performance indicators, graphic diagrams, risk matrix, analysis and synthesis.

RESULTS AND DISCUSSIONS

Theoretical and historical background

The concept of Public Private Partnership (PPP) may be defined for our methodological purposes, as „any contractual arrangement between a public sector agency and a for-profit private sector concern, whereby resources and risks are shared for the purpose of delivery of a public service or development of public infrastructure” [4].

As resulting from the relevant EU documents in this field [5], there are some key features

which characterise these PPP, such as: the cooperation between a public partner and a private partner involving a long-term relationship; the funding of the projects mostly done by private partners; the public entity is focused on the objectives to be achieved in the term of public interest and is responsible for monitoring the project, for the quality of the provided services and the pricing policy; the private partner is usually responsible for the stages in the project like design, completion, implementation and funding; risk management through risk sharing between partners, as some risks are being transferred from the public entity to the private partner.

For the provision of municipal water and wastewater services, the PPP basically constitutes an alliance between the public and private sectors, supplying water and/or wastewater services to the customer who will in turn pay a tariff or tax to the partnership. Hence in the public-private partnership, ownership of assets remains public and only certain functions are delegated to a private company for a specific period.

As we shall further analyse in the next section, the most common forms of PPPs, in the order of increasing responsibilities for the private partner, are:

- the management contract (for 4–7 years), under which the private operator is only responsible for running the system, in exchange for a fee that is to some extent performance-related<
- the lease contract (for 10–15 years), under which assets are leased to the private operator who receives a share of revenues;
- the mixed-ownership (joint-venture) company in which a private investor takes a minority share in a water company with full management responsibility vested in the private partner;
- the concession (for 20–30 years), under which the private operator is responsible for running the entire system. Investment is mostly or fully financed and carried out by the private operator.

The management and lease contracts are used to increase efficiency and improve service

quality, while asset sales and concessions primarily aim to reduce the fiscal burden or to expand access to WSS services. Often several of the objectives and motives are combined, resulting also in hybrid forms of the above cited models of PPP.

In the European Union and worldwide, the public-private partnerships (PPPs) are the most common form of private sector participation in water supply and sanitation today, but some forms of Public Private Partnership (PPP) have been long since used in the procurement and operation of water infrastructure. For instance, the water sector in France has always been characterized by a coexistence of public and private management, with their respective shares fluctuating over time. The two largest private companies are Veolia Environnement (formerly the Compagnie Générale des Eaux founded in 1853), and Suez Environnement, (formerly Lyonnaise des Eaux founded in 1880). The share of the private sector gradually increased from 32% in 1954, 50% in 1975 and 80% in 2000, by using a new model instead of the concession contracts: the new lease contracts (*affermages*) made the private operator only responsible for operation and maintenance, while major investments became a responsibility of the municipalities [6].

As in 2011 (according to the Pinsent Masons Water Yearbook (2010–2011), 909 million people (13% of the world population) were served by private WSS operators, in different forms of PPP arrangements. This estimation includes 309 million people in China, 61 million in the United States, 60 million in Brazil, 46 million in France, 23 million in Spain, 15 million in India and 14 million in Russia. In Chile, the Czech Republic, Armenia and four African countries – Côte d'Ivoire, Ghana, Gabon and Senegal – PPPs assure water services to the entire urban population, while in Hungary they serve almost half the population (see Table 1 for a selection of data on countries and cities with some form of PPP in the WSS sector).

As may be noticed from the presented experiences and the data in table 1, all kind of

countries (with developing, middle income, advanced, even socialist national economies), from all over the world, have involved Public Private Partnerships in providing their water supply and sanitation networks and services. This is a proof that PPPs can provide solutions to communities faced with the need to improve critical infrastructure or find cost efficiencies to help fund necessary projects. However, due to the several sectoral specificities, such as: the extremely high capital costs, mostly financed with long term debt and the relatively low rates of return on investment in the WSS business, private operators are particularly sensitive to the quality of the investment climate and the level of risk, which is an important obstacle to Public-Private Partnerships in many regions of the world.

Table 1: Countries and types of PPP contracts in the WSS sector

	Country	Start date	Population and cities served	Type and number of PPP contracts
1.	China	2001	27 cities and towns	Concessions (22), full privatizations (3) and management contracts (2)
2.	Bulgaria	2000	Sofia	Concession (1)
3.	Cuba	2000	Havana	Concession (1)
4.	Czech Republic	1993 (reform) and 2001 (Prague)	Prague and 23 other cities	Concessions (24)
5.	Côte d'Ivoire	1960 in Abidjan 1973 country-wide	All urban areas	Lease (1)
6.	France	1853	9000 localities	Concessions and leases
7.	Gabon	1997	All urban areas	Concession (1)
8.	Germany	1999	Berlin	Mixed-ownership company (1)
9.	Ghana	2000	All urban areas	Management contract (1)
10.	Hungary	1994	Budapest, Szeged, Debrecen and five other cities and towns	Concessions (8)
11.	Poland	1992	Gdansk, and other 7 cities and towns	Full privatizations (4), concession (1), leases (2) and management contract (1)
12.	Romania	2000	Bucharest, Ploiești and Otopeni	Concessions (3)
13.	Spain	1867	Barcelona and more than 1,000 other municipalities	Mixed-ownership companies and concessions
14.	Saudi Arabia	2008	Riyadh, Jeddah, Mecca	Management contracts (3)
15.	United States	1772	73 million people	Investor-owned and 2,000 PPPs

Source: Own research and selection, from various references above cited in the text

As we shall detail further, considering the specific risks of the sector and the financial challenges brought by the crisis, an important

issue is the selection or development of the right model of PPP arrangement.

Risks of the WSS projects; allocation and management through PPP

Risk is an unavoidable factor in the provision of water supply and sanitation services. Both the public contracting authority and the private operator know that future values of certain variables, such as demand, interest rates, and foreign exchange rates, are important for the project. Future water demand, for instance, depends on growth in per capita income and population as well as changes in the weather, preferences, and technology, variables which cannot be forecast with certainty.

Aiming to analyse the mechanism for improved economic and financial risk management through PPP in the WSS sector, we should first try to identify the main risks since quite many risks affect the water sector; one risk is often a bundle of other, more specific risks and some risks are interrelated. The economic risks faced by the water sector for the provision of WSS can be divided into two broad categories [7]:

-*Investment-related risks*—the set of risks associated with investment in new infrastructure;

-*Operation-related risks*—the set of risks associated with operating and maintaining service.

Within these broad categories there are many more specific risks; we shall analyse some of them and their potential interrelations, according to a civil engineering study [8]:

a) *Risks of design and construction (D&C)*; normally associated with the procurement of treatment or distribution assets and determined by obsolete or inappropriate technology, cost overrun, program delay, inadequate quality control. The D&C (including technological) risks are likely to have major impacts on other specific risks, such as the long term O&M risks and the risks of compliance.

b) *Risks of operation and maintenance (O&M)*; O&M risks involve defects, rising energy and material prices, deterioration and depreciation of assets, structural failure, process failure or obsolescence, supply and demand balance, raw water quality and quantity, site security and cost efficiencies. If these risks are not properly

managed, they could lower the service performance or raise the operating costs of the utility.

- c) *Risks of compliance*; are externalities imposed by the law, environmental agencies or the regulator. For WSS suppliers in the EU, these are in the form of compliance with the WFD and other water Directives (98/83/EC on the quality of water intended for human consumption), water resource constraints such as abstraction licenses and non-revenue water (NRW) / leakage targets.
- d) *Commercial risks*; in general, commercial risks cover demand risks, the price elasticity of water demand (i.e. the customers' response in water consumption when facing a tariff increase), present and projected demographics of the area, water consumption patterns, illegal connectors, billing and bad debts and the social cost of pollution in the case of wastewater. Here we included also the tariff risks, although the WSS service tariff level is either regulated through a tariff adjustment mechanism or determined politically.
- e) *Financial risks* are the investment-related risks occurring when there is a change in the cost of capital to the utility. Main factors which determine these risks are the interest rate, the exchange rate, the crediting rating of the utility, and the local capital market development.
- f) *Risks of transaction* are incurred whenever a transfer of assets or human resources takes place and relate to uncertainties in the quantity, quality and cost of these assets.
- g) *Regulation and legal risks* to consider here are existing legal or regulatory framework for the provision of water and wastewater services, resolution of legal disputes as well as enforceability of the legal provisions.
- h) *Political risks* concern the stability and socio-economical behavior of the society, the trustworthiness of the government and the general political environment.

Management of these risks is quite a difficult task, therefore the advantage and aim of private participation in a PPP, as a mechanism of risk management in the WSS sector, is to allocate risks and responsibilities between the WSS operator and the contracting authority so that:

- each responsibility is allocated to the party best able to undertake it;
- each risk is borne by the party best able to manage it.

Therefore, the standard models of the public-private partnership in the water supply and sanitation sector are defined by a particular mechanism of the responsibilities and risks allocation:

PPP type I: the management contract

Under a management contract the operator fills key management positions in the water company with appropriately skilled staff. The publicly owned water company continues to be accountable for other responsibilities, such as undertaking new investment. In this arrangement, the private sector partner will provide O&M and/or capital programme management services and receive an annual fee from the public partner. The revenue collection function is usually retained in the public sector and the scope and mechanism of risks transfer is limited, but performance generally improves. Apart from the D&C, the O&M and compliance risks, almost all other major risks are owned by the public sector.

An example of PPP through management contract is that of Armenia, in the Central Eastern Europe and Central Asia region. A management contract for the service area of the Armenia Water and Sewerage Company (AWSC), serving 37 towns and 280 villages throughout the country with about 600,000 inhabitants, was initially signed in 2004 with the French company SAUR International for 3 years and then extended. In the area served by the AWSC, within the first 2.5 years, the management contractor increased revenue collection by 24%; decreased energy costs by 15% and water losses by 20%. The number of metered connections has increased by 76% [9].

PPP type II: affermage-leases

Under an affermage-lease, responsibility for operating and maintaining existing assets, plus commercial and management responsibilities, pass to the private operator. The public contracting authority usually retains responsibility for new investment.

Here, the risk transferred from the contracting authority to the operator is usually quite significant, but the mechanism of risk transfer depends on the details of the contract and, in particular, the way the operator's remuneration is determined: under an

affermage, the tariff adjustment rules that matter most are those applying to the operator's tariff (or affermage fee); under a lease, the operator gets the customer tariff minus a lease payment, so the tariff adjustment rules that matter most are those that apply to the customer tariff.

For instance, the characteristics of the Chaumont municipality contract are common to most affermage contracts in France. The operator Société Lyonnaise des Eaux, owned by SUEZ, provides water and sanitation services on the basis of two different contracts, which were signed simultaneously (as stipulated by the French law). As for the mechanism of main risks allocation, the municipality bears most of the investment risks, while the private operator carries operational and commercial risks [7].

PPP type III: joint-ventures

In this type III of PPP, the public-private partnership is more intimate and integrated, since the public and private sector form a joint venture to provide water and wastewater services to the customer. It is a good practice for the public sector to inject the water infrastructure assets and the private sector partner to contribute with the capital, to form a joint venture company. This is potentially the most complicated of the four types of PPP mentioned here but is also an increasingly modern and popular model favoured by the different stakeholders.

The joint venture model permits the sharing of risks in the form of profit-and-loss sharing. This allows the redistribution of savings and potential benefits in a project between the public and private partner, a provision which is usually conspicuously missing in PPP projects [10]. The public sector will have to retain a certain degree of risks in areas like O&M, revenue collection and financing, compliance (Figure 1).

An example of joint-venture (mixed-ownership) PPP is that of Berlinwasser of Berlin, Germany. It supplies water and provides wastewater treatment services to a population of 3.7 million in Metropolitan Berlin and surrounding areas. This type III PPP was formed between the Berlin

Government (50.1%) and a private consortium (49.9%) that consists of Allianz, RWE and Veolia (then Vivendi) (10%: 45%: 45%) in 1999. The public sector retains the majority stake, but employs the entrepreneurship of two experienced private utilities while retaining the board control of the undertaking [8].

PPP type IV: concessions

Under a concession the operator assumes full responsibility and exclusive right to operate, maintain and carry out investment in a public utility and the risk transferred from the contracting authority to the operator is usually substantial, but depends particularly on the rules for adjusting the customer tariff.

As a handy example, we are able to cite the water and sewer system of Bucharest (capital of Romania, population of 2.3 million), privatized in 2000 through a 25-year concession to the French company Veolia. The Bucharest Municipality assigned the rights and obligations to manage the public WSS services and related public assets to the company Apa Nova București, on the company's own risk and expense, in exchange for a fee payment (royalty). To reduce the risk of low water demand, the concession contract foresaw the possibility to increase tariffs beyond the contractually foreseen increases, if total water use was more than five per cent below water use in the previous year [11].

According to a recent report [12], this PPP for municipal water services is praised being considered very successful since „under the private operator the utility: has raised service quality above Romanian standards and toward Western European levels; by 2008 efficiency gains had produced cost savings of US\$349 million. The concessionaire has financed US\$259 million in investment, without public subsidy, while keeping tariffs well below the Romanian average”.

In figure 1, we summarize and represent in a risk matrix, the mechanisms of risk sharing for each of the main 4 types of PPP models for the WSS services; as indicated graphically by the arrow, the degree of private responsibility and risk taking increases from left to the right.

The political risk was not included in the risk matrix since it is not a project risk element, but may impact on the choice of the PPP model. If the political risk is rather high, the private sector will tend to choose one of the first types of PPP models from the left (I or II), in order to minimize its overall risk exposure.

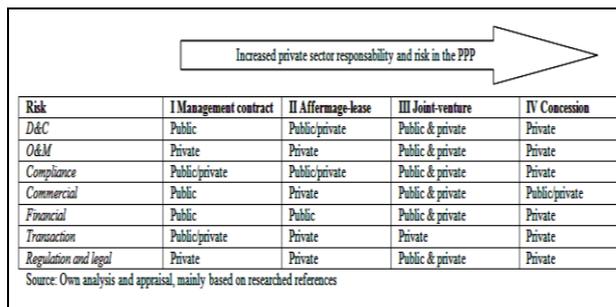


Fig.1. Risk matrix (risk sharing mechanisms) of the main PPP models in the WSS sector

A recent study on the PPP in the water sector [13] has identified, besides many other trends and features, the technological, demand and financial risks as the most important risks lately faced by the WSS sector in two EU member countries (Poland and Portugal), in the recent years of economic crisis. Using the method of a comparative analysis, the paper also highlighted some worthy common as well as different issues that appear in the mature, saturated Portuguese market and in the fresh and developing Polish market economy, for the acceptance, implementation and development of PPP models for WSS.

CONCLUSIONS

In our opinion and according to the cited literature, PPP agreements are resourceful and should be used more widely in the financing and development of WSS infrastructure and services. "The main advantage of a concession is that full responsibility for operation, maintenance and investment moves to the private sector, thus provides a commercial incentive to operate efficiently, while continuing partnership with government. The authorities should consider themselves as partners with the private sector in the

provision of high quality environmental services and at responsible cost" [14].

Indeed, in times of economic and financial distress, it is normal for the public sector - to be prudent and risk averse, but this should not prevent municipalities and governments from developing effective and strong PPP for WSS infrastructure and services.

The best approach is to develop a true partnership relationship so that each risk element is fairly allocated to the party best able to manage it or even shared between the parties (as in the type III joint-venture PPP). Actually, we would recommend the joint-venture PPP as the best suitable and opportune model of PPP in the WSS sector nowadays, since it allows for innovation, expansion and job-creation. A careful SWOT analysis should be conducted for the companies entering in the joint venture, in order to optimize the share of private participation and the mechanism of risk sharing.

In all the PPP options for the WSS utilities, although there are many opportunities for sharing and transferring the specific risks, the public authority remains responsible for overseeing the activity and for ultimately ensuring that public needs are met. Governments retain final responsibility for setting and enforcing performance standards; also, the PPP arrangement for WSS services must be very well designed, regulated and carefully implemented in order to avoid the trend of transferring too much of the risks incurred by the water sector to the end-users of the WSS services, namely to the impoverished customers [2].

Unless continued access to water services of the poorest people is ensured at a reasonable cost, and sufficient levels of transparency in decision making are ensured, social resistance to Public-Private Partnerships has still to be expected. Thus, many Public-Private Partnerships have encountered difficulties due to insufficient attention being paid to the social consequences of involving the private sector as they often implied tariff increases due to a move towards the full recovery of operation and maintenance costs through

tariffs. For instance, returning to our Romanian concession Apa Nova Bucharest, the bulk of investments were financed through commercial loans and, indirectly, by customers through the company's retained earnings. However, tariff adjustments (the latest in force from 01.03.2013) were possible only after the fifth year of the concession and needed approval from the National Regulation Authority for the Public Utilities Community Services, ANRSC.

In the case of the capital city of Bucharest, the WSS PPP works with good results in the water quality and economic efficiency performance, as shown by [12] and [15]. However, for Romania, the primary objective of private sector involvement is attracting capital investment, with technological know-how and financial capacity, to help for the development of the WSS networks and services as required to comply with the EU water Directives and also to increase the access of Romanian population to public water supply and sanitation services (national average rate of connection of dwellings to WSS, of only 65% in 2011, preliminary data according to latest NIS survey). This environmental sector needs demanding investments: from the about €12 bn total estimated in 2007-2013 period (for the whole water sector), only about €5.4 bn are foreseen from the EU funds [16].

Hence, the first specific objective of the SOP ENV is the improvement of quality and access to water and wastewater infrastructure, by providing water supply and wastewater services in line with EU practices and policies, in most urban areas by 2015 and by setting efficient regionalised water and wastewater management structures. Still, the Priority Axis 1 "Extension and modernization of water and wastewater systems" faces some problems, shortcomings and challenges for a higher absorption of EU structural and cohesion funds available for the effective development of the water/wastewater infrastructure, since the co-financing and implementation capacity of the Regional Operators has proved to be too limited.

The process of regionalisation and aggregation of the Romanian water sector was a strategic move, being expected to create, besides economies of scale, also a large enough demand base for the Regional WSS operators to become attractive for private sector participation [17].

Besides, the Sustainable Development Strategy of Water Supply and Sanitation Public Services- Romania 2025 supports the involvement of private capital in large investments, especially through PPP arrangements required to achieve to major construction and expansion of treatment plants and wastewater. Considered ways to open the market for water and wastewater strategic private operators are: the licensing process, mandatory performance indicators, public tender for the WSS services not licensed yet.

Another good outlook for the WSS PPPs is that, to induce a growth of the use of the public-private partnership, the European Union offers the possibility to finance these projects through structural funds or through innovative financial instruments.

Thus private investments may be attracted in domains where the financial risk would be too big to make attractive an investment, when the domains are included in EU priorities, such as the environmental protection or the climate change [18].

REFERENCES

- [1] Frone Simona, Frone, D.F., 2012a. Water Infrastructure and Socio-economic Development Issues, in Recent Researches in Environmental and Geological Sciences, WSEAS Press, 2012
- [2] Frone Simona, Frone, D.F., 2012b. Factors and Trends of Economic Efficiency in the Water/Wastewater Sector, in Procedia Economics and Finance, Volume 3, Elsevier, 2012
- [3] Frone, Simona, 2012c. Issues on the Role of Efficient Water Pricing for Sustainable Water Management, in Romanian Journal of Economics nr.1 (43)/2012
- [4] Akintoye, *et.al* 2003. Public-Private Partnerships Managing risk and opportunities, 1st edn, Blackwell Science Ltd, Oxford, UK.
- [5] European Commission, 2004. Green Paper on Public-Private Partnerships and Community Law on Public Contracts and Concessions Com (2004) 327 final
- [6] Cezon, P., Breuil, L., 2011. PPP to develop drinking water services: some lessons from the French experience for developing countries, in: Aymeric Blanc and Sarah Botton: Private water services in developing countries, Agence française de développement, 2011,
- [7] Public-Private Infrastructure Advisory Facility & the World Bank, 2006. Approaches to private participation in water services : a toolkit, the IBRD, 2006
- [8] Chiu, T. Y. C., Boshier, C. B., 2005. Risk sharing in various public private partnerships (PPP) arrangements for the provision of water and wastewater services, Thames Water, 2005
- [9] Asian Development Bank, 2008. Armenia Water Supply and Sewerage Company: A Good Practice of Private Sector Participation, by Vijay Padmanabhan, Urban Development Specialist, December 2008
- [10] Northam, G., 2004. Report on PFI. Transcript of "File on 4", British Broadcasting Corporation, UK
- [11] Apa Nova, 2012, The concession contract, retrieved on May 14, 2013
- [12] World Bank, 2011, Water in Bucharest: A Utility's Efficiency Gains under a Concession, February 2011, Viewpoint Note No. 326, by David Earhardt, Melissa Rekas and Martina Tonizz, retrieved on May 14, 2012
- [13] Chłosta Katarzyna, 2012. Public-Private Partnerships in the Water Sector: A Comparison between Poland and Portugal, IST Lisbon, 2012
- [14] Platon, V., 2004. Financing of the activities on environment protection. Between theory and practice. Economic Publishing House, 2004
- [15] Matei, Lucica, 2005, Empirical Approaches of the Public-Private Partnership in the Services of Public Utility, in Theoretical and Applied Economics, Vol 10(505), AGER, 2006
- [16] Government of Romania, Ministry of Environment and Sustainable Development, Sectoral Operational Programme Environment 2007-2013, SOP ENV 2007
- [17] Frone, Simona, 2008. Factors and Challenges of Regionalization in the Water and Wastewater Sector, in Romanian Journal of Economics No.2 (36)/2008
- [18] Zaharioaie Marina, 2012. Appropriate Financial Instruments for Public-Private Partnership in European Union in Procedia Economics and Finance, Volume 3, Elsevier, 2012

IMPACT OF THE ECOLOGICAL TREND UPON HOUSE BUILDING

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Abstract

The American and Romanian house market has imposed harmonious and comfortable living in ecological houses whose building does not affect the environment. The implementation of modern and efficient building of long-term sustainable houses has resulted in a new ecological building technology by the Wood Framing System which is developed and applied on a large scale in the US. This system is a cheap and accessible method to build houses and preserve them in time, as well as provide all the comfort demands. Also, the houses built within this system are adapted to any architecture style (traditional, contemporary, and futurist). The house structures built within the Wood Framing System are conspicuous through the optimum use of the wooden material, resistance, stability, ductility, low weight which thus reduces the earthquake impact, durability, high thermal comfort, competitive price. At the same time, the building time on the site is up to 70% lower, compared with the brick-based houses. Within the framing system, a wooden-structure house provides important advantages, and thus has become of interest on the Romanian market.

Key words: drywall, extruded polystyrene, foundation, mineral wool, roof, waterproofing, wood

INTRODUCTION

Wood is the only healthy, natural material of construction [1].

We like to go back to the woods because this material emits sensory stimuli that we agree [3]:

- the warmth and the decorative safety of its colour, its texture, direct links with nature, harmony, beauty, atmosphere, brilliance, delightful smell, acoustics, grace.

- so-called diseases of civilization: stress, aggression and other psychological trauma manifest themselves very rarely to those who live in an environment rich in wood [6].

A cut tree is a symbol. The dominant quality of the fir-tree is fluidity [4]. It helps us to overcome energy bottlenecks created by fatigue and stress [2].

In and around spruce and fir trees, choleric people calm down, their hot temper finds a balance. The two trees clean and open respiratory pathways, strengthen the lungs and helps us breathe more deeply. Spending some time in the vicinity of spruce and fir trees, we find activation of blood circulation and strengthening of the nervous system.

Houses built on wooden structure to customize the exceptional qualities of thermal and noise insulating floors that adjusts vertically and transfers heat very effectively dampens even the most bothersome noises [12].

Wooden structures can get more easily and cost-effectively, varied and spectacular finishes.

Due to the low weight, the foundation needed to ensure the sustainability of construction is much lower than that required of a house brick, thus significantly decreasing the cost of construction of a wooden house without the required safety level also decreased [7].

Because wood is an environmentally friendly material that consumes less energy in industrial processes [8], is a biodegradable material, well adjusted the temperature and humidity in the house, it is recommended and preferred builders beneficiaries.

Great flexibility offered by wooden architectural avoids high energy consumption and hence energy savings [9].

In case of fire, wood is the only material that preserves the mechanical properties in seismic

zones is recommended only wooden houses [10].

MATERIALS AND METHODS

Construction material used in making houses Residence Wood Framing system is wood. These green house offers the opportunity to achieve at a very reasonable price and in a short time

The technology used for building insulation prevents exchange with the outside temperature thereby keeping very cool part of the house in summer and warm in winter. To be as fire resistant as any other building, there is the possibility of treating the wood with fire resistant solution, but at the same time does not affect the health of occupants of the house.

Because construction is easy to apply technological system and good elasticity, wooden houses made in this way provides a far superior seismic durability of masonry houses. Internal vapour barrier and anti-moisture exterior finishes provide protection against moisture structure of any kind.

The walls are made of prefabricated panels form through modern technology and which considerably reduces the execution time of construction, thus decreasing the cost of labor for installation and therefore the building.

RESULTS AND DISCUSSIONS

Building new houses using the Wood Framing highlights the strength, stability, ductility, low weight of its own (thus reducing the impact of earthquakes), durability, comfort and competitive price. Also, the execution of such houses is up to 70% less than for the houses based on a masonry structure. The advantages of a house made of Wood Residence achieving walls in the form of prefabricated panels, leads to an increase in the quality execution of these elements, through their factory with modern machines and technologies, and an appropriate technical and at the same time reduced prefabrication during the construction of the building, thus

decreasing the mounting labor cost and building default.

Due to low weight, the foundation needed to ensure sustainability of the building is much reduced compared to that required by a house brick, thus significantly reducing the cost of house construction o, without diminishing the desired safety.

Houses built on wooden structure are conspicuous by the exceptional thermal and sound-isolating qualities of their floors. They adjust vertical heat transfer and lower even the most disturbing noises very effectively (noises made by the high heel shoes, children's trample, the falling of a heavy object).

Wooden structures can receive varied and spectacular finishes more easily and at lower costs. A well-executed floor, according to details of the structure, is as strong as one of reinforced concrete. Because of the lightweight construction, the technological system applied and their very good elasticity, prefabricated houses made in this way offer higher earthquake durability than the masonry-based houses. The internal barrier against steam finishes and anti-humidity structures provide protection against moisture of any kind.

The technology used for building insulation prevents the temperature exchange with the outside, therefore it keeps the coolness of the house very much during summer and warmth during the winter. To be as fire resistant as any other construction, it is possible to perform a wood treatment solution to fire resistance, which it does not affect the house residents' health.

The ecological green houses on wood structure has several advantages such as:

- » Wood structure is light in comparison with masonry, it requires a simple foundation is elastic, providing increased resistance to the construction.
- » High heat and sound coefficient.
- » Reduced execution time (2-3 months maximum).
- » It creates an interior and exterior finishing based on latest materials.

- » Pleasant appearance (can build different shapes and patterns).
- » The inside of the apparent beams and framework.
- » Modules are executed and finished in the factory, the assembly in the field takes maximum 48 hours.

FOUNDATION:

The foundation is made of reinforced concrete in Amvic casings (casings of expanded polystyrene) that provides both resistance and thermal insulation at this level.

HOUSE BASE:

It is a basic element of construction, which runs through tracing and attachment wall structure for resistance to the building foundation.

It is made up of a wooden cupboard with sizes 45x90, 45x135mm, having the same width with a wall that supports it.

The house base is placed on a waterproof layer and provisionally set in the first phase hobnailed or wood screws and, after mounting on the ground floor walls, they are connected through reinforcing-steel clips existing in the foundation.

HOUSE GIRDLING:

It provides link to the top of the prefabricated panels. The girder is fixed to the upper side of the prefabricated panels by knocking in nails.

It consists in a wooden cupboard with sizes 45x90, 45x135mm, having the same width with the wall which it supports.

It is fixed to the connection sections of the prefabricated panels in lagging sections.

FLOOR:

The floor is made of wooden beams over the foundation, special metal sets that fix the foundation beams, OSB panels, extruded polystyrene, light blankets.

WALLS:

The walls are the main elements of strength and stability of construction, providing vertical takeover of the floor and framework weight, as well as horizontal loads from earthquake and wind load and transmit them to the foundation.

An important advantage of the framing system is the possibility to make the walls in the form of prefabricated panels. This leads to

increased quality of execution of these elements, through their factory with modern machines and technologies and an appropriate technical control; at the same time, prefabrication significantly reduces the execution time on the field of construction, thus decreasing time length of the construction on the field, the default cost and building cost.

The items of the vertical resistance walls are fixed to the girdles of the horizontal panels with square nails and galvanized metal. The exterior wall panels are usually coated with OSB plates of 12mm in size, which provides rigidity and work plan of the lateral sides, thus resulting in a rigid wall in its plan. The interior wall panels are arranged against the wind by horizontal and bent rulers between the pillars.



Fig. 1. Structure of ecological house



Fig. 2. Foundation and structure of ecological wooden houses

The walls can be as follows:

- resistance of wood reinforced with metal attachment and special nails.
- exterior walls: expanded polystyrene, OSB, wood wardrobe, mineral wool, metallic structure for gypsum board, gypsum board.
- interior walls (for compartmenting): gypsum board, steel structure for gypsum board, wood wardrobe, mineral wool.

FLOORS:

The floors are the horizontal building loads of weight taking over people and furniture and walls, and transmitting their weight to the walls; at the same time, they ensure the cooperation of walls and horizontal distribution of horizontal wind loads and earthquake.

The main elements of resistance are the floor beams. The beams consist of closet resinous wood, sections of 50x135, 50x180, 50x230, 50x280mm, interspaces placed at 400 and 600mm, rigid in connection with transverse distance of the closet with the same section. The system of beams and cross distance with the floor form solid and rigid assembly with a rigid washer.

The beams are connected to the girdles by nails, bolts, cupboards and galvanized shackles

The support layer is put over the pillars, and it consists of: wood floor plane of 22 and 45mm in thickness, the floor 24 and blind 45mm, OSB plates of 22mm in thickness. The floor is available in a single layer or two layers in different directions.

On the bottom of the floor, beams can directly strike the layer of finish: gypsum board, paneling, etc. or may remain apparent and is varnished.

Floor above the ground floor: It is made of gypsum board, steel structure for gypsum board, wood beams, mineral wool, OSB, extruded polystyrene, special metal attachment.

THE FRAMEWORK is built of wood shingle oil, metal tiles or Metrobond tiles.

The roof resistance structure can be run in two variants, namely: chairs on roof framing, and roof framing beams on the lattice.

Frameworks are composed of a bucket and squared pane of resinous wood, sections of 90x90, 90x135, 135x135, 135x180, 135x230mm together forming a rigid stiff resistance by windproof and roe buck which supports the pane, the chert merge. The roof timbers have section dimensions 50x90, 50x135, 50x180, 50x230mm.

The floors on lattice beams are composed of strong wooden lattice, made in closets of 45x90mm, and merge the nodes with feathered claws by pressing. The lattice beams are windproof on the upper foundation to create a rigid cover plan.

In both cases, the cover support consists of 24mm in thickness or OSB plate of 12 mm.

Waterproof of bitumen membrane is placed over the layer support of the cover

As cover material, there can be used: tile, galvanized, onduline sheets of bardolyne, Lindab board, eternite, etc.



Fig. 3. Ecological house built in Wood Framing System



Fig. 4. Ecological house built in Wood Framing System

Ceilings inclined to the attic, consisting of the structure itself, are thermally isolated with mineral wool mattresses, with of 150, 200mm in thicknesses.

FINISHES:

Finishes are made as follows:

- decorative plaster on the outside or American Siding PVC
- washable dye works in the interior.
- wooden staircase.
- PVC joinery plus double glazing windows.
- interior doors wooden cell.
- exterior doors in PVC, metal or wood.
- sanitary, heating and electrical installations.
- central heating.
- steel radiators or heating in the floor.
- doubleclick parquet.
- tiles and faience in the bathroom and kitchen.
- sanitary items.
- treated and flame retardant fir.

CONCLUSIONS

Due to the advantages of running costs and reduced time to achieve these green houses Wood Framing system, they are very popular at the moment compared to conventional systems implementation and execution of the houses.

Because of the lightweight construction, applied technology system and good elasticity, wooden houses made in this way provides a far superior seismic durability of masonry houses.

Increasingly, more and more builders and beneficiaries choose this system of construction of green houses, especially at the holiday because wood has special qualities. Wood is flexible and easy it more resistant to earthquakes to masonry or concrete house. With a large number of advantages in the realization of timber houses, is a material becoming more preferably in construction.

REFERENCES

[1] Honțuș Adelaida, 2005, Construction Farmhouses, Ceres Publishing House, Bucharest

[2] Crisan Rodica, Gogulescu S., 2006, Wood Construction, Second Edition, Publishing University "Ion Mincu" Bucharest

[3] Frisch Carola Evelyn, 2001, Für den Zehn arguments Hotzbau, Lignum, Zurich

[4] Borer Pat, Harris Cindy, 2008 The Whole House Book: Ecological Building Design & Materials

[5] Manoliu I., 2004, Foundations and methods of foundation, EDP, Bucharest

[6] Stan D., 2004, Building and Environment, Matrix Rom Publishing House, Bucharest

[7] *** Design specifications for construction, vol I, II, III (collectively STAS) /

[8] *** Design prescriptions for buildings, vols I, II, III (STAS collection)

[9] *** Responsible Environmental Design & Construction

[10] *** Bulletin Bois, Lignum, Zurich, Nr. 56/2004

[11] *** Journal of the construction, 32, 35, 41/2004

[12] *** American Forest & Paper Association, Design of Wood Frame Structures for Permanence, American Wood Council

USAGE OF FOOD HEALTH CLAIMS AND RELATED CONSUMER UNDERSTANDING

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Abstract

Very few studies in various countries have been conducted in the context of effect of food health claims onto consumer health and purchase behavior. Health claim messages vary from country to country; but overall consumers view these claims as useful. Generally it is observed that consumers prefer short and concise health claim messages as compared to more long and complex ones. Moreover consumers are of the viewpoint that health claims are more effective if supported and approved by government. Foods with health claims are viewed healthier by consumers, but in some cases consumers may get discouraged by health claims when they are unable to properly comprehend the intended message of nutrition claims. Consumers remain vague between distinguishing health claims, content and structure-function of nutrients. Furthermore there is past evidence that in few instances consumers have improved their dietary choices and knowledge regarding health concern because of use of health claims by manufacturers and governing bodies. This study is a review of contemporary health claim practices in the global upfront.

Key words: consumers, foods, health claims, nutrition claims

INTRODUCTION

There are several health claim statements that describe the relationship between food components and preferred position of fitness. In daily life, we see different types of health and nutrition claims and catalogue of nutrients found on packaging claiming specific features of food about existence or level of nutrients e.g.; sugar free & low fat etc. Codex Alimentarius described three types of claims:

-Nutrient function claims refer to function of nutrient in physiological development, functions and growth of human body.

-“Enhanced function claims” or “Other function claims” are those which claim that nutrients or other substances amend or advance the functions of human body such as calcium improve the bone density.

-Reductions of disease risk claims are those which may reduce the risk of some diseases e.g.; use of fruits & vegetables may reduce the risk of cancer.

The food products all over the world normally have function and content claims. However, it

is observed that promise of health improvement and reduction in disease varies widely across different products. The National regulatory body has forbidden and restricted such claims, while only permitting such claims after approval from the body. The World Health Organization recent survey in 74 countries and areas on global regulatory environment regarding health claims revealed that 35% was not exercising regulatory claims, 30% barred any claim, 23% permitted nutrient claims and function and small proportion 7% allowed particular disease reduction risk claims or they had particular skeleton for endorsement of these claims.

A debate on value of health claims has been going on for over 15 years and these is used as strategy for consumer awareness and sustain the improvement of food supply of healthier nutrients. The Pappalardo and Calfee from Bureau of Economics in the US Federal Trade Commission (FTC) reviewed the influence of Kellogg’s All-Bran promotion that had advice from National Cancer Institute on consumption of dietary fiber in prevention

of cancer. This campaign ultimately forced US Food and Drug Administration (FDA) in developing new regulatory regimes for health claims and making of the “Nutrition Labeling and Education Act 1990”. Today, the health claims changed markets from food’s promotion on convenience, taste and factors unrelated to health to markets focused on health. The health claims and nutrition labels on food packaging improve the public health by helping consumer in making better decisions about food products. The diet disease claims empower consumer to put the pressure which lead to companies to market nutrition products (Mathios A, Ippolito P. 1998). Other critics argued that health claims are awareness tools that affect consumer behavior (Patch CS et al., 2004). There is also a possibility that the consumer receive deranged messages which have extensive advertising on value-added and highly processed products instead of basic foods such as fruits and vegetables (Earl, R. 1988). There is also an apprehension that health claims cannot help consumer without encouraging educational atmosphere. In a study on health claim in Australia for folate, Bower, C. (2001) recommended that folate claims in isolation can’t appropriately answer the need for consumer literacy about claims and nutrition labels. They can be only used as means in identifying foods which have high folate and this claim gives the reason to buy and consume the food having high folate.

In Australia, Public Health Association of Australia opposed the preface of health claims in Australia by giving the support that health claims which improve food choices and inform consumers in full of loopholes. Other critics claim that health claims improve the sales of more nutritious products. Some other claim that health claims put a positive impact on healthy choices of consumers (Lawrence, M. Rayner, M. 1998). Some consumers are willing to pay more for those products which have added functional benefits and health claims (Van Assema, P. et al. 1996). The FMCG companies are doubtful of their value and philosophy and they have argued that the processed foods health claims help people

who are trying to sell food. Some companies make health claim in creating arts which contain only healthful effects but they do not provide the name of disease (Katan, M. 2004). The health claims have different results in different countries. In US and Europe, health claims help in increasing market share and also help in communicating consumers about responsibility of diet in disease avoidance, wires research on food ingredients and in product development. On the other hand, there are also some product failures which have such claims (Fulgoni, VL. 2001). In WHO research, it is proved that health claims have small role in nutrition literacy, and there is scarce support regarding claims’ effect on diet of people (Hawkes C. 2005).

There is a methodological challenge in measuring impact of health claims on consumer behavior. Marketers of food companies recommended that health claims impact one third sales of products. The literature of this is based on published and unpublished articles related to health claim, labeling, packaging and nutritious products and behavioral patterns of consumers.

The basic purpose of this review is to examine the consumer behavior when they are exposed to health claims. The objectives of review are to evaluate:

- To what extent health claims have relationship with health outcomes;*
- To what extent consumer react to health claims;*
- To assess the influence of health claims on consumer knowledge and purchasing patterns;*
- How consumers recognize and infer health claims; and*
- Gaps those still stay alive in current study in this area.*

MATERIALS AND METHODS

In order to reach its goals, the research work is based on survey and group methodologies for evaluating and predicting consumer behaviour regarding nutritious products and health claims.

RESULTS AND DISCUSSIONS

In order to check effect of health claim on purchase behavior, the consumers have to be exposed to them.

In a survey in US, claim that there is a little evidence of impact of health claims on consumption of food. In US where health claims have been allowed for over ten years, there are a small proportion of companies found without health claims on labeling. The cereal products have highest level of usage of these claims. A range of surveys across different countries specify that health claims do affect the attitude of people. In Canada of survey of functional products, 45% people believed that packaging should have health messages whereas 34% believe that components are enough to make consumers aware of nutritious products and they also favored health claims more than content claims.

In countries across Europe, like Ireland (Shine. A, et al. 1999), Denmark (Bech-Larsen, T. and Grunert, K. (2003), Finland (Urala, N. 2003), Scotland (Tessier, S. et al. 2000), the United Kingdom, and Australia and US, the studies regarding health claims have similar results. Sometimes the liking of health claims are related to difficulty in interpretation of health claims messages. In a study in France, the consumers said that they never used the nutrition information because of its complexity. In a study in UK in 2003, 29% of participants believed that the labeling has insufficient information to facilitate them to reach healthy products.

Consumers said that they perceived the claims more effective whose are not clear to them. Consumer said that use information available on label in finding healthier food products. it has also been recommended that claims have more impact on consumers which are exposed to nutritious products for many times rather than consumer who is going to purchase product for first time. In an Australian research in 2003 found that 14% of people using health claim and in UK, 20% of people use health claims in purchase of a product. It is proved that claim usage is higher among

older, educated and female consumers because of their high interest in nutrition habits. The consumers have limited or lacks of knowledge have limited abilities to assess health claim and this phenomenon can reduce reliability of those claims. The consumers are doubtful about information available on labels and there is also a concern regarding manufacturers in using health claims as using a sales tool. People show trust on these messages which are shown frequently by various trusted sources. Most of their consumers also believed that the health claims are approved by government agencies which facilitate the acceptance of health claims among consumers (Mason, M. and Scammon, D. 2000).

The type of health messages favored by consumer is vague. A study in Sweden recommended that consumers prefer those claims having advertising of health rather than avoidance of disease, but in United Kingdom, United States and in other Scandinavian countries studies report that claims of prevention of diseases were more important near consumers rather than health protection. The cultural forces play big role behind these influences. The content, length and wording are also important factors in understanding the claims. The consumers don't like complex, lengthy and scientifically worded statements of claims. Consumers favor split claims with a short and snappy statement on front and detailed information anywhere on the label. The words like "may" and "could" create doubtful claims and consumers in United States favored "may reduce" and "helps reduce" statements for claims (Bruhn, CM. et al. (2).

CONCLUSIONS

There is need of more research in understanding impact of health claims on food choice or preferences of consumers. The present studies provided the different results among different consumers segments and different food products across different countries. The different other factors such as innovativeness and openness to normative

influence other than advertising and price influence consumer purchasing behavior. There are some universal results:

-Consumer preferred to use products with health claims.

-Consumers are doubtful about health claims and they strongly believe that health claims should be approved by government agencies.

-Consumers do not like complex, lengthy and difficult worded statements but the clear and easy claims with information on the front of packaging.

-The results from case studies prove that people got nutrition awareness and make better food choices because of health claims.

-There are not any unfavorable consequences of health claims.

[12]Tessier, S. et al., 2000, Use and knowledge of food labels of shoppers in a city with a high proportion of heart disease, *Journal of Consumer Studies and Home Economics*, Volume. 24, pp. 35–40.

[13]Urala, N., 2003, Strength of health-related claims and their perceived advantage, *International Journal of Food Science and Technology*, Volume. 38, pp. 815–826.

[14]Mason, M., Scammon, D., 2000, Health claims and disclaimers: extended boundaries and research opportunities in consumer interpretation *Journal of Public Policy and Marketing*, Volume. 19, pp. 144–150.

[15]Bruhn, CM. et al., 2002, Consumer attitudes toward use of probiotic cultures, *Journal of Food Science*, Volume. 67, pp. 1969–1972.

REFERENCES

[1]Hawkes C., 2004, *Nutrition Labels and Health Claims: The Global Regulatory Environment*. Geneva: World Health Organization. <http://whqlibdoc.who.int/publications/2004/9241591714.pdf>. Accessed June 8, 2005.

[2]Mathios, A. and Ippolito, P., 1998, Food companies spread nutrition information through advertising and labels, *Food Reviews*, pp. 38–44.

[3]Patch, C.S. Tapsell, L.C. and Williams, PG., 2004, Dietetics and functional foods, *Nutrition and Dietetics*, Volume. 61, pp. 22–29.

[4]Earl, R., 1988, Health claims on food labels: an American Dietetic Association perspective (ADA timely statement), *J Am Diet Assoc*, Volume. 88, No.234, pp. 236-238.

[5]Bower, C., 2001, What can we say about health claims?, *Australian Journal of Nutrition and Dietetics*, Volume.58, pp. 209–210.

[6]Lawrence, M. and Rayner, M., 1998, Functional foods and health claims: a public health policy perspective, *Public Health Nutrition*, Volume. 1, pp. 75–82.

[7]Van Assema, P. et al., 1996, Effects of health claims on eating habits of the Dutch population, *European Journal of Public Health*, Volume. 6, pp. 281–287.

[8]Katan, M., 2004, Health claims for functional foods, *BMJ*, Volume. 328, pp. 180–181.

[9]Fulgoni, V.L., 2001, History and industry benefits of health claims, *Nutrition Today*, Volume. 36, pp. 119–120.

[10]Bech-Larsen, T., Grunert, K., 2003, The perceived healthfulness of functional foods. A conjoint study of Danish, Finnish and American consumers' perceptions of functional foods. *Appetite*, Volume. 40, pp. 9–14.

[11]Shine. A, et al., 1999, Consumer use of nutrition labels, *British Food Journal*, Volume. 99, pp. 290–296.

THE POTENTIAL OF THE RURAL AREA DEVELOPMENT OF STEFAN VODA COMMUNE IN CALARASI COUNTY

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Abstract

The concept of development means all forms and methods of socio-economic development, and it is based first of all on ensuring a balance between these socio-economic systems and the elements of natural capital. Călărași county is situated in the South-East part of the country and of the Romanian Plain, on the left shore of the Danube. It has a surface of 5088 sqkm and it occupies 2.1% of Romania surface. The relief is mainly represented by fields. The county depends on agriculture and economy in the rural area. In the rural area of Călărași county 49.1% of the total population in the country lives, most involved in agricultural activities or activities related to it. Communes are the most important category of administrative units, both numerically and in terms of population. The proposed paper presents aspects regarding the potential of sustainable development of Stefan Voda commune in Călărași county.

Key words: commune, region, rural area, rural development

INTRODUCTION

Calarasi county is situated in the South-East part of the country. It has a decreasing population and a density of about 62.6 inhabitants/km, we must consider it as being mostly rural, counting 194,190 inhabitants in the rural area (59% of the total population in 2009) that represents with 21% more than the average of the countries that joined EU recently. Thus, the rural and agricultural development will form a solid pillar. The county success and prosperity depend on its own economic performances. The county is dependent on agriculture and economy in the rural area. The spread of globalization threatens the traditional agriculture.

MATERIALS AND METHODS

For the presentation of Stefan Voda commune, the information collected from the Sheet of each locality, provided by each local council and information collected from the County Department of Statistics and from Călărași Department for Agriculture and Rural Development.

The sheets provided by the County

Department of Statistics were analysed, for the elaboration of the diagnosis analysis of the commune, that included: data about commune situation and about its physical-geographical characteristics; statistics and census made at local level, in demography, labour force employment sectors, economic sector, education and culture, animal and vegetal production.

Also the SWOT analysis was used for evaluation the present status of the commune and rural area development.

RESULTS AND DISCUSSIONS

Ștefan Vodă commune is a new commune, which formed in the place of the former Sohat, "GRĂTARU", which existed before 1895, in the very place of the commune today [1]. Sohatul Grătaru was a gathering of a few huts, and even a few little houses, in which the land workers or shepherds were living with their flocks coming on manor properties. In winter, some of them retreated to Calarasi town, where land owners and tenants were living, such as Stănculescu, Tudorache Miulescu Guțulescu, whose descendants are living today. Siliștea Station was established

in 1884 almost halfway between Calarasi and Ciulnița. The station was called Siliștea until 1920, when its name changed to "Fălcoianu" in the memory of Fălcoianu General who died in the First World War.

In 1894 the first allotments were made here according to the rural law. They split from the estates Calarasii Vechi property, 1500 ha of arable land. Then they were given jobs and places for houses construction on this property. The documentary record of this village was in 1895. The main economic activity is agriculture and services providing. Following the analysis of the data in the table below, we can mention:

Ștefan Vodă communes lies on a surface of 7.152 ha, of which 95,5% is arable land, and the rest of 4,5% is occupied by yards 3,4% and roads 1,0%. At the end of 2011 it had 808 houses, 0,6% less than in 1992 and 7,4% less in 2002;

The population is formed of 2.346 persons in 2011, and in the analyzed period it is remarked a decreasing trend, the year 2011 having with 10,8% less persons than year 1992.

Table 1. Commune surface

Agriculture surface according to its use – hectares	6749	6749	6749
Arable land - ha	6701	6701	6701
Surface – vineyard and vine nursery - ha	48	48	47
Surface with non agricultural land total - ha	403	403	403
Surface with water and ponds – total – ha	-	-	-
Surface with constructions total - ha	22	22	22
Surface – ways of communications and railways total – ha	157	157	157
Surface with degraded and non productive land – total - ha	224	224	224
Agricultural surface – private ownership – ha	6888	6888	6888
Arable surface –private ownership - ha	6691	6691	6692

Source: Statistical Yearbook of Călărași county, 2011

From the data taken from the Statistical Yearbook of Călărași county it results that the total population of the commune on 1st July 2011 was of 2463 inhabitants. The social-economic conditions have a remarkable influence also regarding the multiple aspects on the structure and evolution of the demographic phenomena. In the table below it can be seen the natural movement of the population in Ștefan Vodă commune.

Table 2. Population movement

Indicator	2009	2010	2011
Total population on 1 st July	2457	2476	2463
Born – live	43	21	24
Deceased	24	32	36
Natural gain	19	-11	-12
Marriage	15	7	7
Divorce	2	5	5
Born - dead	0	0	0

Source: Statistical Yearbook of Călărași county, 2011

As regards the labour force, the total number of employees in 2011 was 111, 34 persons being employed in agriculture, forestry and fishing, 22 persons in education, 14 persons in public administration and 16 persons in social care and health.

In the rural area of Ștefan Vodă commune, 12 companies are located, of which 4 on agricultural sector.

Following the previous table, we can note the structure on activity sector of the SMEs existing in Ștefan Vodă commune:

- The agricultural sector is represented by a number of 4 companies, established in the period 1994-2007, of which we can notice 2, SC CHIREA SRL and SC CHIREA 2000 SRL, belonging to the same entrepreneur, with a number of 15 employees, respectively 14, both being specialised on cereal crops (except for rice), vegetables and oil seed plants;

- The commerce is represented by 6 companies, all in the sector of en detail commerce in non specialised stores, selling mainly food, products, drinks and tobacco, the most recently established being Sc Florymar Com Impex SRL, in 2007;

- Services sector has 2 companies, both

established in 2008, SC Ormih Construct SRL and SC Vulcan Prest Com SRL, the first in the sector of residential and non residential buildings works, with a number of 5 employees and the second with 1 employee, in the sector of vehicle repair and maintenance. [2]

Further on, we present the situation of the surfaces grown with the main crops in Stefan Voda commune

Table 3. Surfaces grown with the main growing in Stefan Voda commune in the period 2009-2011

Surface	UM	2009	2010	2011
Surface grown with cereals	ha	4150	4600	4800
Surface grown with maize	ha	380	400	612
Surface grown with sun flower	ha	1600	1800	2123
Surface grown with vegetables	ha	27	30	38
Surface grown with vineyards	ha	102	99	75
Surface grown with fruit trees	ha	1800	2173	3581

The Table 4 presented the evolution of the animal stock in Stefan Voda commune [3]

Table 4 The evolution of animal stock in Stefan Voda commune in the period 2009-2011

Categories	UM	2009	2010	2011
Cattle	head	123	37	35
Swine	head	1100	970	712
Sheep	head	1330	1107	853
Poultry	Head	12104	10300	9800

The SWOT analysis highlighted the strengths, weaknesses, opportunities and threats of the studied commune.

The SWOT Analysis is a strategic planning method of analysis by identifying internal and external factors that may affect the proposed strategic objectives by evaluating the strengths and weaknesses of an initial reference situation.

Strengths

- people are interested in local business sector development;

- various funds can be accessed, access to which we can rely on the expertise of local staff;

- best of electricity and telecommunications networks (access to both landline and mobile).

- the existence of numerous companies with vegetable, livestock and agriculture services and marketing profile;

- high share of private ownership of arable land;

- possibility to use the compost in agriculture;

Weaknesses

We mention the weaknesses of the commune:

- lack of more opportunities of fun and leisure (parks and gardens);

- poor access to social services and health services;

- Poor adaptation to European standards in agriculture;

- crop diversification is little used in farms and agricultural lands are fragmented;

- total lack of tourist infrastructure in the commune

- limited access to sources of information.

Opportunities

- sustainable development of the community there are various sources of funding (for economic competitiveness, rural development, environment, regional development, improve infrastructure, increase government capacity and human resource development);

- developed agricultural, vegetable, livestock and favourable natural leisure potential;

- spatial ability leisure;

- potential for organic farming;

- economic potential by selling compost or business development in the field of organic farming;

- potential for using renewable energy sources (solar, biomass and biogas);

- increased potential for projects in partnership with neighboring communes;

- attracting potential investors;

- Potential for the development of food processing sector.

Threats

- underestimation of the rural area;

- lack of capital to support investment;

- poor utilization of the existing potential

- slow development of the rural economy;

- increasing disparities between rural communities;
- youth migration to the urban areas;
- widening discrepancies in the rural communities and their excessive depopulation;
- decrease the number of pupils, due to low birth rates, partial degradation of cultural infrastructure (community center, library);
- adverse weather conditions for traditional agriculture due to the global warming that will result if urgent action is not taken to a risk of desertification;
- the need for huge and long term investments.

CONCLUSIONS

SWOT analysis highlighted as *strengths* the resources ensured by the good quality of the agricultural lands but also the activities in the livestock sector; the most important *weaknesses* of the communes consists of the poorly developed infrastructure, the lack of jobs and population aging; the main *opportunities* are represented by the respondents desire for development, the possibility to access national, intra-community subsidies and attract foreign investments; the *threats* consist of the imminent depopulation, lack of capital, lack of information that can diminish considerably the development chances;

From the above characteristics resulted the image of a community that has the desire for the development of the rural area but an aging community from demographic point of view, with poor opportunities on the labour market, but with a very high level of cooperation potential in order to achieve some common goals, including regarding the achievement of public goods.

The vision regarding the economic-social development of the rural communities in Călărași county is the creation and support of the competitive, stable, healthy and diversified social economic sector, to ensure the continuous economic growth and the increase of the quality of life of the commune inhabitants.

REFERENCES

- [1]**Commune Ștefan Vodă, <http://scoalastefanvoda.blogspot.ro/2009/08/scurt-istoric-desi-comuna-luat-fiinta.html>
- [2]Source: **Firme Info, 2012, Information on companies in ȘtefanVodă commune, Călărași, <http://www.firme.info/calarasi/stefanvoda.html>
- [3] Tables processed according to the data taken from the Statistical Yearbook of Romania 2011
- [4]**Ștefan Vodă commune, <http://scoalastefanvoda.blogspot.ro/2009/08/scurt-istoric-desi-comuna-luat-fiinta.html>
- [5]**Agricultural Register of Ștefan Vodă commune, 2012

THE POTENTIALITIES AND THE AGRICULTURAL PRODUCTION ACHIEVEMENT LEVEL IN OLT COUNTY

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Abstract

This paper aims at investigating the current situation of rural development perspective based on knowledge of the human factor in Olt County. The first and most important observation is the repercussions on the demographics of rural population structure and balance in Olt County where it appears on one side of its unevenness, with a trend of diminishing the employment, hence the number of employees. The analysis of agricultural density, represented by the area in hectares / capita reveals the existence of a low level of rural population pressure on agricultural space. On the structure of agricultural branches it was surprised on one hand the annual variation in levels of achievement, but on the other hand the share of services which is insignificant. All this contributes to the low attractiveness of agriculture for young people in the rural county of Olt.

Key words: *balance labor, cultivated area, land fund, livestock, population structure, the structure of agricultural production.*

INTRODUCTION

Economic and social progress in the modern world seeks rural social stability and well-being of populations, which may occur on one side through knowledge of the local rural economy sectors, and secondly to assess the level and population movements, especially the knowledge degree.

Rural population occupational form has an impact on farmers' income, purchasing power, the ability to invest them and thus the efficiency and competitiveness of agriculture. In this framework were discussed the agricultural production potentials, by a tridimensional analysis, namely: the agricultural production capacity, production and the value of the results obtained. Considered the main argument, the employment impact is differentiated on categories of activities while acting as a bridge between the business components and professional training in rural areas. However, their dimensional structure presented in this paper substantiates the necessity of

knowledge of rural development trend of this county.

MATERIALS AND METHODS

In addressing the working methodology issue we used the indicators structure method that was based on measurement techniques of the discussed phenomenon and especially its formation relations in diagnosing the phenomena and the performance. We have determined physical and value indicators (through which it was defined the report with every element of a community towards the level / volume of the entire population), indices (as ratio of two indicators), coefficients (which by the structure, balance and efficiency characterize the characteristics level variation of each group / subgroup relative to the characteristics total level) and discount rates (considered a relationship between two comparable logical and economic magnitudes).

RESULTS AND DISCUSSIONS

Nowadays, rural development perspectives of Olt County are considered uncertain, given the conditions in the last few years that have seen a steady decrease in the level of rural economic development indicators.

1. The rural population structure and balance in Olt County. The structure and dynamics population general trend of Romania, more pronounced in rural areas is a problem that will be solved if it is desired the economic development. This reason caused the need to know the demographic problems in Olt County.

Table 1. The population evolution from the Olt County rural area (January 1)

The indicator's name	M.U	2006	2007	2008	2009	2010	2011
Total County (urban + rural)	No.	482350	477292	473128	468931	465019	460334
Total (both sexes) of which:	No.	286241	283292	281591	279688	275955	272675
percent of total population	%	59,34	59,35	59,51	59,64	59,34	59,23
% compared with 2006	%	100	98,96	98,37	97,71	96,40	95,26
Male-total (rural) of which:	No.	142182	140809	139795	138989	137156	135658
percent of total population	%	29,47	29,50	29,54	29,63	29,49	29,46
% compared with 2006	%	100	99,03	98,32	97,75	96,46	95,41
Female – total (rural) of which:	No.	144059	142483	141796	140699	138799	137017
percent of total population	%	29,86	29,85	29,96	30,00 per	29,84	29,76
% compared with 2006	%	100	98,90	98,42	97,66	96,34	95,11

Source: Processed after the data from the Statistical Yearbook of Olt County, INS, Olt County Statistics 2012 Edition[1]

In Table 1 it is shown the structure of the rural population and hence, Olt County in 2006-2011 were no changes in its downwards. Thus, during that period, the following are significant:

- The rural population is decreasing, situation given both by the actual number of inhabitants (from 286,241 people in 2006 to 272,675 in 2011) and the comparisons made (in 2011, compared to 2006, observing a decrease of -4.77%);
- The male population follows as well a decrease in the successive years and the comparative analysis shows the following: annual changes to the total population are

very small; in comparison to year 2006, there was a decrease;

- The female population falls within the same decrease, as in the male population.

Whether the report rural / urban environment can be considered balanced on the civilian population employed in agriculture and forestry in Olt County, through the data presented in

From Table 2, one can see:

- Agriculture and forestry regarding labor resources it finds a level of only 26,35% of the total. From this amount is recorded vital for both the total female labor resources and to the total working age population;

This amount is recorded a preponderancy for women for total labour resources and the total working-age population;

Table 2. The labor force balance in agriculture, sylviculture in Olt County, at January 1, 2011

Indicators	M.U.	Effective at January 1, 2011			Media data 2010
		Total	Men	Women	
Total, of which:	Thousand persons	78.2	33.8	44,4	77.6
Percent of total labor resources	%	26.35	21,70	31,48	27,13
Percent of the total working-age population	%	26.25	21,16	32,15	25,94
Number employees of which:	Thousand persons	1.7	1.3	0.	1.9
Percent of total laborresources	%	0,57	0,83	0,28	0,66
Percent of the total working-age population	%	0,57	0,81	0,28	0,63

Processed according to the data from the Statistical Yearbook of Olt County, INS, Olt County Statistics 2012 Edition[1]

- Regarding the number of employees in agriculture and forestry, it is found that they are in a number of only 1.7 thousand people, representing 0.57% of the total.

By comparison to the total labor resources but also to the total working age population, men predominate (the percentage being 0.83% and 0.81%).

It follows that the agricultural sector of Olt county, has a downward trend of employment, hence the number of employees.

2.The territorial dimension of agricultural potential. Olt County is characterized by a high agricultural potential. He followed the

quantitative aspect (which refers to the potential land resources), qualitative (related to agricultural output) and the result (of the levels achieved values).

The land and structure in Olt county cultivated areas. By nature and its specificity, the land of Olt county, is a very valuable natural resource.

Olt County which has an agricultural area of 433 903 ha, in the national context is placed in seventh place from which [1]: arable land - 6th in the country, vineyards - ranked 10th in the country, orchards - 17th the country; pastures - the 36th in the country, hayfields - 34th in the country.

The main crop groups surfaces [2], through the surface levels for the period 2006-2011 are given in Table 3 for Olt County.

-the total area under cultivation is less than the arable area, and in the last year of analysis (2011) we see a decrease with 76337 ha, which represents-19,65%;

Table 3. The cultivated areas evolution on the main crop groups in Olt county, during 2006-2011

Indicator	M.U.	2006	2007	2008	2009	2010	2011
Total cultivated area	Ha	331377	292908	331289	335050	336851	312266
	%	100	100	100	100	100	100
Cereal grains	Ha	268332	235592	257028	265378	241589	238785
	%	80,97	80,43	77,58	79,21	71,72	76,47
Grain legumes	Ha	494	191	738	1289	843	427
	%	0,15	0,07	0,22	0,38	0,25	0,13
Oil plants	Ha	41860	42547	54749	49858	71179	51452
	%	12,63	14,53	16,53	14,88	21,13	16,48
Medicinal and aromatic plants	Ha	492	107	30	107	2635	-
	%	0,15	0,04	0,01	0,03	0,78	-
Other cultures	Ha	20214	14440	18744	18418	20605	21602
	%	6,1	4,83 m	5,66	5,5	6,12	6,92

Processed according to the data from the Statistical Yearbook of Olt County, INS, Olt County Statistics 2012 Edition[1]

- The grain cereals group frames a majority surface, that although it was decreasing in the years dynamic, is predominant (is between 80.97 and 76.47%);
- Grain legumes with the lowest percentages for this district are still considered minor crops;
- Oil crops, through the annual cultivated areas represents increasing levels, so that in

2011, the increase is 3.85% compared to 2006;

Note that through the land reform initiated in the early nineties and completed after 2000, the issue of land received new values so that most land categories were privatized in a considerable proportion [5].

Livestock and animal productions obtained. Livestock, according to data presented in Table 4, shows a steady decline, but differentiated.

Table 4. The animals number evolution in Olt County,

Indic.	MU	2006	2007	2008	2009	2010	2011
Cattle -total	Heads	60938	60132	55266	45482	32981	32326
	% compared to 2006	100	98,67	90,69	74,63	54,12	53,04
Pigs-total	Heads	217559	205949	201525	188267	183570	178800
	% compared to 2006	100	94,66	92,63	86,53	84,37	82,18
Sheep -total	Heads	130238	139323	136102	131269	87002	88218
	% compared to 2006	100	106,97	104,50	100,79	66,80	67,73
Goats -total	Heads	29483	32984	34856	40025	60370	57653
	% compared to 2006	100	111,87	118,22	135,75	204,76	195,54
Horse s-total	Heads	27272	31988	32448	33657	24345	23518
	% compared to 2006	100	117,29	118,97	123,41	89,26	86,23
Poultry-total	Heads	2717271	3001245	3071596	2360901	2631385	2476882
	% compared to 2006	100	110,45	113,04	86,88	96,83	91,15
Bees	families	16859	18857	18718	18523	28398	27427
	% compared to 2006	100	111,85	111,02	109,87	168,44	162,68

during 2006-2011

Processed according to the data from the Statistical Yearbook of Olt County, INS, Olt County Statistics 2012 Edition[1]

Regarding the structure of livestock in the dynamics of the period 2006-2011, the following aspects can be highlighted:

- For cattle, pigs and sheep is recorded successive annual decreases;
- For poultry and horses, in the first stage, there is an increase in the number, followed by a reduction. For horses that reduction in 2011 compared to 2006 is -13.77 and -8.85% for poultry;
- In the case of the goats herds of and bees families, there is annual increases, the amplification of them being in 2011,

compared with 2006 + 95.54% and respectively 62.68%.

From here we can deduce the existence of zootechnics production capacities with the mention that the private sector is the most significant. The data presented in Table 5 shows for 2006-2011 the main livestock products, resulting the following:

Table 5. The animal production evolution in Olt County, period between 2006-2011

Name of the indicator	MU	2006	2007	2008	2009	2010	2011
Meat (slaughtered live weight)-total	Tons live weight	27285	31042	30332	28065	26579	24916
	% compared to 2006	100	113,76	111,16	102,85	97,41	91,31
Cow milk – total	Thousand hl	1436	1549	1510	1286	1013	988
	% compared to 2006	100	107,86	105,15	89,55	70,54	68,80
Sheep's milk and goat's milk – total	Thousand hl	225	252	238	231	271	269
	% compared to 2006	100	112	105,77	102,66	120,44	119,55
Wool-total	Tons	230	322	268	266	230	225
	% compared to 2006	100	140	116,52	115,65	100	97,82
Eggs-total	Million pieces	256	319	322	208	233	217
	% compared to 2006	100	124,60	125,78	81,25	91,01	84,76
Honey extracted – total	tons	778	607	541	518	769	710
	% compared to 2006	100	78,02	69,53	66,58	98,84	91,25

Processed according to the data from the Statistical Yearbook of Olt County, INS, Olt County Statistics 2012 Edition[1]

-Meat productions, cow milk, wool, eggs and honey, are increasing in the first period (2007-2008), followed by a decrease. Structurally, the largest share is held by pork followed by poultry meat;

- Sheep milk productions, has an increase, which in 2011 is 19.55% higher compared to 2006.

From all this it can be inferred that the animal production are directly related to livestock, following in general, livestock the trend.

2. - The development of agriculture, surprises on one hand, the willed trend to develop this industry, and on the other hand the limited possibilities for the agricultural products capitalization.

The Agricultural Output Value in Olt County, as a synthetic indicator, shown in Table 6, through the values rendered for the period 2006-2011, reveals the following:

- Data Values have in 2001-2004 MU of million ROL and since 2005 MU of thousands RON.

Table 6. The agricultural production structure in Olt County, during the period 2006-2011

Indicator	MU	2006	2007	2008	2009	2010	2011
The total agricultural sector value, of which:	MDL	1321319	1072806	1931732	1779899	1875620	2315761
	percent of total	100	100	100	100	100	100
vegetal	MDL	852064	549267	1322404	1174546	1348345	1756239
	percent of total	64,49	51,2	68,46	65,99	71,89	75,84
animal	MDL	465708	515864	600902	593920	523449	556960
	percent of total	35,24	48,09	31,11	33,37	27,91	24,05
agricultural services	MDL	3547	7698	8426	11433	3826	2562
	percent of total	0,27	0,71	0,43	0,64	0,2	0,11

Processed according to the data from the Statistical Yearbook of Olt County, INS, Olt County Statistics 2012 Edition[1]

- The total value of agriculture is increasing, so that in 2011, compared to 2006, the growth is with 75.26% higher;

- The crop production is preponderant; the share to the total having variations between 51.2% and 75.84%, in the successive years there is an increasing trend;

- Although, on the overall, the animal production register an increase in absolute numbers, by comparing the years 2011/2006 with +91252 thousands lei, the variations in the years structure were between 24.05% and 48.09%;

- Agricultural services towards the agricultural sector total value, records annually the lowest levels (between 0.08% and 0.58%), but increases are evident in this period (in 2011, compared to 2006, the level is higher with + 155%).

Given the annual variations previously analyzed, it is considered necessary to know the agricultural production indices level of agricultural goods and services, which for Olt is shown in Table 7.

In the 2006-2011 period dynamics, for total county, from which the agricultural production sectors structure, it can be outlined the followings:

- For the county's total, the total agricultural production index varies in the years structure, the lowest level was recorded in 2007 (72.4%), and the highest in 2008 (153.5%).

Table 7. Trends in the agricultural production index of agricultural goods and services in the Olt County, for the period 2006-2011

Rating level	MU	2006	2007	2008	2009	2010	2011
TOTAL of which:	%	113.5	72.4	153.5	107.1	94.8	111.8
	%	100.0	39.6	135.2	94.4	83.5	98.5
-vegetal	%	109.6	51	208.6	116.8	60.0	116.2
	%	100.0	46.5	190.3	106.6	88.1	106.0
-animal	%	121.4	110.8	95.6	85.4	92.7	100.8
	%	100.0	91.3	48.9	70.3	76.4	51.6
The PRIVATE SECTOR, of which:							
TOTAL of which:	%	113.4	45.6	153.4	107.1	94.8	113.5
	%	100.0	40.2	135.3	94.4	51.9	100.1
-vegetal	%	102.0	32.1	209.4	117	96.4	118.7
	%	100.0	29.3	191.4	106.9	88.1	108.5
-animal	%	121.3	110.9	95.6	85.4	92.7	100.8
	%	100.0	91.4	49.0	43.7	76.4	83.1

Note:-the agricultural production Index is calculated based on the ring formula: $\text{Sum}(Q1P0/Q0P0)$;
 Processed according to the data from the Statistical Yearbook of Olt County, INS, Olt County Statistics 2012 Edition[1]

- Fluctuations occur emphasized for vegetal sector (between 51.0% and 208.6%) and animal sector (85.4% and 121.4%);
- The private sector is currently considered the main property area in the agricultural production system, for which the analyzed indexes have similar levels of amplitude.

CONCLUSIONS

From the analysis, it can be outlined the following conclusions:

- 1.-Rural populations and its employment level is characterized by progressive migration flows between urban and rural population, with a trend of diminishing employment, hence the medium employees number.
2. - The land fund and the cultivated areas structure is relevant by the existence of differentiated territorial structures that can be illustrated by the following: arable land is the predominant category of use, but there is a slight downward trend, the pastures and meadows share is very low; the categories vineyards / nurseries and orchards / nurseries are considered significant. From the comparisons presented it was showed that the total cultivated area is less than the total arable land, which the predominant is the grain cereals group.

3. Vegetal and animal productions made in the Olt County. Annual and comparative achievement levels, compared with 2006, outlines a growing trend for productions of cereal grains and oil crops, medicinal and aromatic plants, with significant variations in crop yields of grains legumes. Livestock numbers as well as productions obtained fits in a different structural decline. Animal production are directly related to livestock, which have been decreases in most products. It should be mentioned that in Olt county are few specialized livestock farms, and most animals are raised in households and used for ensuring a minimum standard of living.

4. The agricultural production value and realization index in the Olt county. It records an increasing trend, but by analyzing the agricultural branches we surprised, on one hand, the annual variation of vegetal and animal sectors achievement levels, and on the other hand, the services share, that is insignificant.

REFERENCES

- [1] INS, Olt County Statistical Yearbook, Olt County Statistics, 2012 Edition
- [2] Economy of Olt County, available at, <http://www.cjolt.ro/cjolt/servlet/portal?action=ContentAction&actEvent=showRubric&id=economie>;
- [3] "Investește în oameni !", NEWSLETTER, no. 2, January 2010;
- [4] "Proactiv - de la marginal la incluziv", Project co-funded by European Social Fund through the the Sectoral Operational Programme Human Resources Development 2007-2013;
- [5] Vrabete Mihaela et al., Project "Elaborarea planului de amenajare a teritoriului județean Olt, Faza I Documentare și studii de fundamentare", project planners URBAN INCERC, SC HALCROW SRL.

THE BUSINESS ENVIRONMENT AND THE CURRENT LEVEL IN EDUCATIONAL FORMATION FOR OLT COUNTY AGRICULTURE

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Abstract

The work seeks to underscore its correlative aspect of business initiatives and labor force training from Olt County rural areas. The high schools and alumni structure analysis for the agricultural and veterinary profile of Olt County, shows a variation in the number of agricultural high schools, but an annual discrepancy between the students enrolled number and the graduates number. Simultaneously, from the holdings dimension analysis, it can be seen the accented character of a subsistence agriculture. In the analysis performed it may also be indicated the farming business manifestation / rural areas. Through all these, it can be synthesized the fact that business development in agriculture is related to the need to monitor the total business entrepreneurs evolution, along with their training level.

Key words: active units, business ideas, enterprises, high school level, rural community, professional training, profile

INTRODUCTION

Given the potentials and rural environment diversity, most business ideas are based on a structure that has a high degree of diversification (require smaller or larger investment, depending on the nature and work extent). Because they are strictly correlated with the results obtained in labor force training, for which in the Olt County rural, education issues are still limited. These is due to reduced physical access opportunities, poor learning conditions, poverty as well as the relatively education high cost (including the basic education) that a rural community significant proportion cannot afford. It may be added the qualified teachers relatively low proportion in rural areas compared to urban areas.

MATERIALS AND METHODS

From the methodological point of view , through comparative analyzes , we aimed to describe, through a characteristics (variables), the active enterprises differences / structural homogeneity , the rural high schools profile of Olt County in the 2006-2011 dynamics. The

methodological system was focused on sides that took into account the investigation specific aspects of rural active units, along with the professional training system.

For rural firms from Olt County it was taken into account the determination of some indicators in respect to their distribution and dynamics.

The main issues were initially structured as a number of active enterprises / school units but also correlated in scope and employees number terms.

All these were included in appropriate indicators, which for Olt County were calculated during the period between years 2006 and 2011. There have been references to the annual level expressed in absolute and relative values, the analysis continued by making comparisons to the total and the first reference year (2006).

The working methodology pursued a knowledge tendency of the rural active enterprises from Olt County that would allow decisions on emphasizing the social expenditure structure level and which by appropriate indicators would substantiate the ensuring flow prosperity level of production active units through instructional school activities.

RESULTS AND DISCUSSIONS

1. The business environment and active enterprises dynamics in Olt county rural areas. Also, in Olt county rural areas, the results obtained in the company's restructuring and privatization field during the previous years led to the respectively process continuation. A special emphasis was focused on modernizing the activities development of economic agents in the productive sector.

However the rural firms situation in Olt County, shown in Fig. 1 is actually a structure that can be mentioned: trade and motor vehicles repair (53.3%), followed by constructions (12.5%), agriculture (10.6%) and manufacturing (10, 9%).

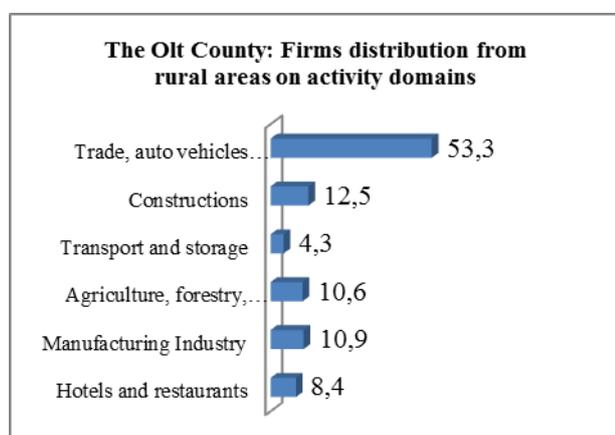


Fig.1. Rural firms distribution in Olt County

Source: Rural entrepreneurship diagnosis, Rural dynamization by sustainable employment ,

Economic activities diagnosis for the opportunities diversification in rural employment, Dr. &es, AGROSTAR 2010.[3]

On activity codes (according to the figures given in Table 1) shows that the highest number is for companies in the food products retail, beverages and tobacco. Further it can be signaled, the companies that are operating in constructions, in bars (including beverage service activities) and trade intermediation.

Table 1. Rural firms number structure in Olt County (on activity areas codes).

Activity Fields	Company No.
4711 retailing food, tobacco and drinks	539
4120 Construction services for residential and nonresidential buildings	209
5630 Bars and other beverage serving activities	156
4619 Trade mediation	145

Source: Rural entrepreneurship diagnosis, Rural dynamization by sustainable employment ,

Economic activities diagnosis for the opportunities diversification in rural employment, Dr. &es, AGROSTAR 2010.[3]

By deepening the analysis it was found that a profitable knowledge source of business ideas was and is fructified by the enterprises / units active existence in Olt county rural area. Below are presented indicators that reflect the employees number in the annual structure for the period 2008-2011, which are analyzed differently for enterprises / units active in agriculture, forestry and fisheries in Olt county. In summary, the active enterprises number structure in agriculture, forestry and fisheries, shown in Table 2, which is divided into groups of employees' number, points out the following:

- The active enterprises total number is growing (from a total of 287 in 2008 to 320 in 2011), the increase compared to 2008 being of 11.49%. But, unlike the county total this number still represents a much lower level (between 4.37 and 5.58%);

- Regarding the grouping by employees number, it can be seen that the highest companies number have up to 9 employees (in the last year 2011 these firms hold 87.18% of the existing rural and 5.49% of the total county). Successively, the enterprises from the groups of 10-49 and 50-249 employees have the lowest percentage levels.

Table 2. The active enterprises dynamics in agriculture, forestry and fisheries in Olt County

Indicator's name	MU	2008	2009	2010	2011
Total	Number	287	313	311	320
	percent of total	4,37	4,75	5,07	5,58
	% compared with 2008	100	109,05	108,36	111,49
1-9 employees	Number	255	282	283	279
	percent of total	4,26	4,66	5,04	5,49
	% compared with 2008	100	110,58	110,98	109,41
10-49 employees	Number	29	27	24	37
	percent of total	6,19	6,27	5,83	6,98
	% compared with 2008	100	93,10	82,75	127,58
50-249 employees	Number	3	4	4	4
	percent of total	3,29	5,00	4,65	4,08
	% compared with 2008	100	133,33	133,33	133,33

Processed according to the data from the Statistical Yearbook of Olt County, INS, Olt County Statistics 2012 Edition[1]

Simultaneously in the period 2008-2011 dynamics it can be seen a slight increase both in total and for each of the groups analyzed.

The analysis was continued towards the active local units knowledge in agriculture, forestry and fishing, for which, in the same annual growth rate.

The data presented in Table 3 revealed the following:

- as total active local units number are increasing, only in the past year 2011 which compared to 2006 is up to +1.88%. Also, there can be signaled annual rates oscillations, that through the comparisons against 2006 can be observed declines for most years;

Table 3. The dynamics of local units active in the agriculture, forestry and fisheries in Olt County

Name of the indicator	MU	2006	2007	2008	2009	2010	2011
Total	number	318	302	293	318	316	324
	percent of total	5,49	4,90	4,35	4,71	5,04	5,52
	% compared with 2006	100	94,96	92,13	100	99,37	101,88
1-9 employees	number	284	270	256	284	285	280
	percent of total	5,45	4,89	4,22	4,63	5,01	5,43
	% compared with 2006	100	95,07	90,14	100	100,35	98,59
10-49 employees	number	29	26	33	29	25	37
	percent of total	6,38	5,18	6,19	5,95	5,43	6,33
	% compared with 2006	100	89,65	113,79	100	86,20	127,58
50-249 employees	number	4	5	3	4	5	6
	percent of total	4,16	4,58	2,85	4,25	5,15	5,45
	% compared with 2006	100	125	75	100	125	150
250 and over	number	1	1	1	1	1	1
	percent of total	3,22	2,85	3,33	3,84	4,34	4
	% compared with 2006	100,00	100,00	100,00	100,00	100,00	100,00

Processed according to the data from the Statistical Yearbook of Olt County, INS, Olt County Statistics 2012 Edition[1]

- in the employees number structure / local unit there is an analyzed differentiation that can be shown as follows: for the group 1 to 19 employees, where are registered most of active local units representing 5.43% of county all such units and 86 ,41% of agriculture, forestry and fishing such units; the others groups, or 10-49, 50-249 and 250

and above, represents a much lower number, even if the comparison percentage to the total county is at a level between 6.63 and 4.0%.

From these indicators analysis is identified a domain still considered less efficient compared with the existing resources.

The property small areas and the owners reluctance and information lack on the benefits of groups and associations farmers formation across the accessing grants possibilities through the National Rural Development or Community Financial Instruments makes Olt county agriculture and not only, to evolve at a pace inefficient in costs and benefits terms [4].

In summary it can be said that in Olt county, regarding the agriculture, hunting and fishing, evolution of the enterprises / units active number on class size / national economy activity in 2004-2008 showed the following structural changes [4] :

- The Contraction activities for agriculture, hunting and fishing with approx. 13 percent per total , the biggest drop being recorded for large enterprises. Agricultural enterprises represented only 4.42% of all enterprises at the 2008 level;

- The constant increase of fisheries and pisciculture microenterprises, although the share from the total is insignificant;

- Increasing the micro enterprises number with extractive activities;

- a 35.53% increase in manufacturing enterprises number due to a 46.56% increase in the micro enterprises number and a 24.35% increase at medium enterprises . Also, the large and very large enterprises number decreased by approx. 17 and 18%, respectively.

In this framework for a few years, it can be shown a setting up initiation of a cereals stock exchange in Olt county through the Regional Operational Programme Grant. The total value of this contract is 1.9 million, of which 746,000 euro non reimbursable funds, the remaining amount will be supported by the beneficiary Olt County Council. If it is envisaged that in the locality there is a functional port, the cereals stock could revive the economic activity in the area. At the same

time in Corabia , there is tradition in cereals trade and taking into account the existence of a cereals port will enable the potential amplification of the cross-border trade in cereals.

2. The educational training current level for agriculture in Olt County. Based on the appearance in 2010 of the Local Development Plan, which brings together administrative areas, an important role is for attracting population in rural areas, primarily by improving living conditions in rural areas, but also by creating jobs. For these reasons, in this work was considered necessary to know the structural aspect problems of both profile high schools number, and students number, teachers, along with the communal library network.

The structure of high school education in rural areas in Olt County, is a first issue of educational training. The data shown in Table 4, it can delineate the main issues to total comparative county (urban + rural) and in the 2006-2011 dynamics concerning:

Table 4. High school education in rural Olt County

Name of the indicator	U. M.	2006	2007	2008	2009	2010	2011
High schools total (urban + rural)	No.	26	26	26	34	33	33
Students enrolled (urban + rural)	No.	15962	15896	15992	17672	18939	20761
Graduate students-total (urban + rural)	No.	4070	4413	3715	4503	4223	-
Teaching staff (urban + rural)	No.	1161	1087	1151	1055	1135	1299
Total high schools (rural)	No.	5	4	4	10	8	8
	percent of total high schools	19,23	15,38	15,38	29,41	24,24	24,24
	% compared to 2006	100	80	80	200	160	160
Students enrolled (rural)	Number	789	639	606	835	956	1299
	percent of total students	4,94	4,01	3,78	4,72	5,04	6,25
	% compared to 2006	100	80,98	76,80	105,83	121,16	164,63
Teaching staff (rural)	Number	56	47	47	51	65	77
	percent of total DC power.	4,82	4,32	4,08	4,83	5,	5,92
	% compared to 2006	100	83,92	83,92	91,07	116,07	137,5

Processed according to the data from the Statistical Yearbook of Olt County, INS, County Department of statistics, the 2012 Edition[1]

- Total high schools number in rural areas is increasing (from 4 to 8 such schools), representing 24.24% of all high schools in the county in 2011;

- The enrolled students number in the total high schools mentioned is between 3.78% and 6.25%, even if the increase is in 2011 compared to 2006 is with +64.63% higher;

- Teachers as number vary between 47 and 77, which to the total county percentage level is between 4.08% and 5.92%.

In this dynamic the comparison made for the rural high schools of Olt county is highlighted showing an increase in the high schools number (60.0%), students number (64.63%), but for teachers this increase is much lower (37.5%).

Table. 5 - The high schools and graduates structure of agriculture and veterinary profile in Olt County

Name of the indicator	U. M.	2006	2007	2008	2009	2010	2011
Agricultural profile high schools							
High schools number	Number	3	3	1	1	2	2
	percent of total high schools	11,53	11,53	3,84	2,94	6,06	6,06
Students enrolled	Number	385	287	363	520	898	1130
	percent of total students	2,41	1,80	2,26	2,94	4,74	5,44
Graduates	Number	208	-	16	54	77	-
	percent of total absv.	5, 11	-	0,43	1,19	1,8	-
Teaching staff	Number	63	44	10	11	12	19
	percent of total p. d.	5,42	4,04	0,86	1,04	0,57	-1.
Veterinary Profile High Schools *							
High schools number	Number	-	-	1	1	1	1
	percent of total high schools	-	-	3,84	2,94	3,03	3,03
Students enrolled	Number	-	-	166	188	168	175
	percent of total students	-	-	1,03	1,06	0,88	0,84
Graduates	Number	-	-	-	55	42	-
	percent of total absv	-	-	-	1,22	0,99	-
Teaching staff	Number	-	-	40	26	64	60
	percent of total p. d.	-	-	3,47	2,46	5,63	4,61

* The years 2006 and 2007 are not given.

Processed according to the data from the Statistical Yearbook of Olt County, INS, County Department of statistics, the 2012 Edition[1]

This is the reason why we continued the analyze for the high schools and graduates

structure for agricultural and veterinary profile in Olt County.

Table 5 presents the situation, which for the period 2006-2011, can be highlighted the following issues:

- A variation in the number of agricultural high schools, a situation analyzed by a total county percentage comparison represents a level between only 2.94 and 11.53%. Report a yearly discrepancies between the students enrolled number and the graduates number to which it is found that the students enrolled number is increasing, but the graduates number decreasing, tendency indicated also at teachers;

- Veterinary profile high schools (being only one unit of its kind in the county), are represented by an annually growing number of students enrolled (though compared to the total county represents between 1.80 and 5.44 %), but decreasing on graduates (compared to total county level is much lower, between 0.43 and 5.11%). Even in this case the teaching staff, had an upward trend for which in the last year has seen a number of 60.

From the mentioned above, it appears that the structure and forms of agricultural profile high schools influence on the rural population has an important role in alleviating the training and labor employment (with referrals to the forms and functionality of secondary education with agriculture and veterinary profile, and documenting the communal library existence).

CONCLUSIONS

Rural territory economic profile in Olt County, especially the correlation between business ideas and the population educational outline, shown in the paper, reveals the following conclusions:

-Active rural locative units of Olt county, analyzed on activity codes signify the existence of the largest number which belongs to retail trade food firms, beverages and tobacco. It is found that the active enterprises total number in the agriculture, forestry and fishing, is growing, but compared to the total in the county this number still represents a

much lower level. For the rural in Olt county, has resulted the need to know business ideas, business types structure, a situation that was, is and must remain fructified by enterprises activity / active units.

-Educational formation for agriculture in Olt County, has amplified the need to establish structures on education issues. But, they are still limited in rural areas due to reduced opportunities for physical access, poor learning conditions, poverty, and the relatively high cost of education (including the basic education) that a significant proportion of the rural community cannot afford.

-It was observed an increase in the high schools number, students number , but an increase in a lower rhythm for the teaching staff. The high schools and graduates structure analysis for agricultural and veterinary profile of Olt County, signifies a agricultural high schools number variation, but an annual discrepancy between the students enrolled number and the graduates number. All these because the local rural area from Olt County faces numerous gaps in educational training, these represent one of the main reasons why the disparities between urban and rural areas in terms of all its components: rural economy, the potential demographic, health, school, culture, etc.

-To reduce these disparities, one solution is to develop and implement integrated strategies for rural development by local communities, with the starting point, the needs that can be identified at local level and the endogen potential.

REFERENCES

- [1]Olt County Statistical Yearbook, INS, Olt County Statistics, 2012 edition
- [2]Olt County Agriculture, Recolta.eu, 25 November 2010, Agriculture% 20județului% 20Olt% 20% 20Recolta_eu% 20-% 20Cotidia
- [3]Rural entrepreneurship diagnosis, Rural dynamization by sustainable employment, Economic activities diagnosis for the opportunities diversification in rural employment, Dr. &es, AGROSTAR 2010.
- [4]Vrabete Mihaela, *et al.*, 2011, Project “Elaborarea planului de amenajare a teritoriului județean Olt, Faza I

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planners URBAN INCERC, SC HALCROW SRL.

PRIMARY OFFER OF MEAT IN GOIESTI VILLAGE, DOLJ COUNTY

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Abstract

Goiesti common is part of the 104 common that make up Dolj County, is situated in the north of the county, approx. 15 km from the city of Craiova. The commune is mentioned in documents from 1577 on 28 July in a document issued by a big ban of Craiova and includes 13 villages. Name of the village comes from the name given its first inhabitant, namely "Goișteanu" name which today can not be found from any inhabitant of the village, however is the most common inhabitants of the neighboring Simnicu de Sus. Access to the area is by land locality is crossed from south to north by a asphalted national road DN 6B, which connects Gorj county and Craiova (Tg Cărbunești - Târgu Jiu). Elucidating the communal potential, of meat production is based on use of an appropriate set of indicators: effective in exploitation (by species), total production and average yield per head. The study covers the period 2010-2012, taken as a starting point for developing a strategy of reviving the sector of production.

Key words: livestock, meat production, potential

INTRODUCTION

Agriculture is the main occupation of the inhabitants, usually the over-aged. Young people are not really interested in this branch, because the land is less productive to the lowlands and hence is not as pleased.

However farmland is cultivated at a rate of approx. 80-90% due to Romanian and foreign investors who have leased in large part the land and they are working.

Forestry occupies an important place the village being surrounded by forests of oak and locust, and water meadows at the course of the river Amaradia. On some hills where there were groves of fruit trees (plum, apricot, cherry) began afforestation works, not depreciate.

Keep the cattle in farms in Romania, are important food industrial exploitation of forage resources side, the use of labor resources, export, profit sources [1].

Living livestock consists of all animals present in the area at a time. Part of living livestock is considered as a component of operating fixed capital. Operating fixed capital are: draft animals (horses, cattle work, etc.), breeding and production animals (breeding bulls, cows, rams, pigs, etc.).

The other part of the livestock consists of animals living on the rise for sale (fattening steers, calves, lambs, pigs for fattening, etc..), having all of capital circulating features [3].

Livestock structure is influenced by the peculiarities of breeding various species, breeding system practiced, production manager, breeding herd size, etc. [2].

Factors affecting meat production in general can be divided into endogenous and exogenous.

Endogenous factors include health status, race, gender, age and individual characteristics. Exogenous factors include: feeding animals and birds, care, housing and fattening period [1].

MATERIALS AND METHODS

To do the work we have completed two phases: the phase of documentation and data processing phase. The first phase was carried out by using statistical data reporting in the case of commune Goiești [4]. later it's moved to their processing, while using comparison method and composition of structures based on certain indicators used. The data collected and analysed covers the period 2010-2012 are also used average of the period.

RESULTS AND DISCUSSIONS

Table 1 shows the production of meat for the main species encountered by the commune Goești, analyzing livestock slaughtered (Fig. 1), total meat production has been obtained (Fig. 2), and weight at scarification (Fig. 3).

In the structure of meat production can be found slaughtered animals of the following species: cattle, pigs, sheep and goats.

In the case of meat production were slaughtered between 50 and 100 head of cattle (2011 and 2010), the average of the period being 67 heads (-33.0 and +28.8% in dynamics).

The indicator is placed on a descendent trend towards first base decreases reporting being respectively 50.0 and 48.0% for the years 2011 and 2012 respectively.

The number of pigs slaughtered for meat ranged from 800 heads in 2011 and 1500 by

the end of 2010 and 2012 respectively, so that the average of the period reached 1267 ends. The indicator has evolved unevenly decreases since 2011 (-46.7% compared to 2010), followed by increases in 2012 (87.5%).

For the period under review it is found that the number of sheep slaughtered for meat averaged 100 heads, a level that characterizes the entire dynamic range.

Goats used for the production of meat ranged from 200 to 250 heads (first specific value of 2011 and 2012 respectively, the second specific 2010). The average period was 217 heads (-13.2 and +8.5% versus reporting bases - in dynamics).

The production of meat, derived from four species, as follows: bovine provided (on average) 18 t of meat (-32.3 and 38.5% to the terms of comparison). Limitele de variație

Table 1. Meat production

Nr. crt.	specification	Year									Average 2010-2012			
		2010			2011			2012			Effectiv	Dynamics		
		Effectiv	F _{bi}	M _{bi}	Effectiv	F _{bi}	M _{bi}	Effectiv	F _{bi}	M _{bi}		Effectiv	F _{bi}	M _{bi}
1	Operating effectively (head)													
1.1.	- cattle	100	100	100	50	50,0	50,0	52	52,0	104,0	67	67,0	128,8	
1.2.	- swine	1500	100	100	800	53,3	53,3	1500	100,0	187,5	1267	84,5	84,5	
1.3.	- sheep	100	100	100	100	100,0	100,0	100	100,0	100,0	100	100,0	100,0	
1.4.	- goats	250	100	100	200	80,0	80,0	200	80,0	100,0	217	86,8	108,5	
2	Total production (t)													
2.1.	- cattle	27	100	100	15	55,6	55,6	13	48,1	86,7	18	66,7	138,5	
2.2.	- swine	250	100	100	120	48,0	48,0	270	108,0	225,0	213	85,2	78,9	
2.3.	- sheep	3,4	100	100	3	88,2	88,2	3,5	102,9	116,7	3,3	97,1	94,3	
2.4.	- goats	4	100	100	3,5	87,5	87,5	4	100,0	114,3	3,83	95,8	95,8	
3.	Weight at slaughter (kg / cap.)													
3.1.	- cattle	270	100	100	300	111,1	111,1	250	92,6	83,3	273	101,2	109,3	
3.2.	- swine	167	100	100	156	93,4	93,4	160	95,8	102,6	161	96,4	100,6	
3.3.	- sheep	34	100	100	30	88,2	88,2	35	102,9	116,7	33	97,1	94,3	
3.4.	- goats	16	100	100	17	109,4	109,4	20	125,0	114,3	18	112,5	90,0	

The limits of variation of the indicator were 13 t in 2012 and 27 t in 2010. Indicator performed strictly descending successive annual declines being 44.4 and 13.3% respectively in 2011 and 2012 compared to previous terms of the dynamic series, the amount of pigmeat ranged from 120 t in 2011 (-52.0% compared to the year 2010-250 t), up to 270 tons in the case of 2012 (respectively

1.08 and 2.25 times the terms of reference). The average period was 213 t, which in dynamic was decreased by 14.8 and 21.1% compared with the basics of reporting for sheep there is an average of 3.3 t meat, with limits of variation from 3 to 3.5 t - for the years 2010 and 2012.

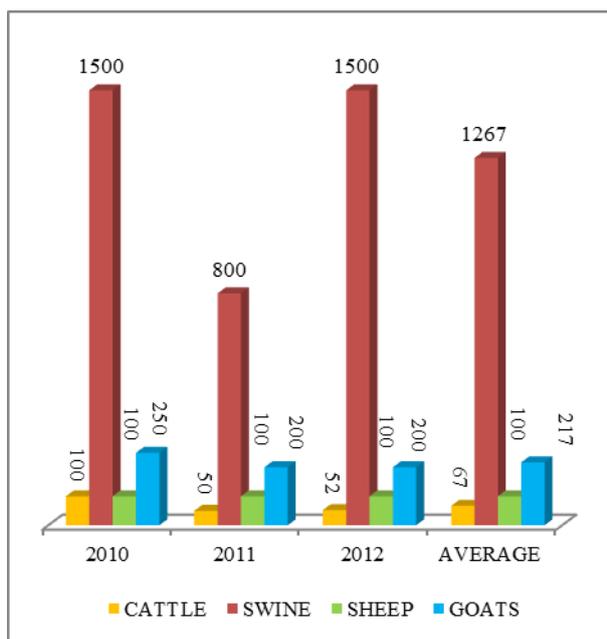


Fig. 1. Total livestock used for the production of meat (head)

The dynamics reveals its uneven development (-11.8% in 2011, +2.9 and +16.7% for 2012, -2.9 and -5.7% for the period average - compared to the terms) goats provided between 3.5 and 4 tons of meat (the first specific level of 2011, the second in 2010 and 2012), while the average of the period was 3.83 t. Following these levels, there is subunitary value of dynamic indices for 2011 (87.5%) and average of of the period (95.8%), and values echuiunitare respectively supraunitary for 2012 (100.0 and 114, 3% for mobile or fixed base indices).

Slaughter weight used in meat production was - on species - as follows: average weight of cattle were recorded from 250 to 300 kg (2012 and 2011), average of the period being of 273 kg. Evolution of the indicator is uneven, increases of 11.1% specific in 2011, followed by declines of 7.4 and 16.7% in 2012; average weight at slaughter for pigs ranged from 156 kg in 2011, up from 167 kg to 2010, the average of the period reaching 161 kg. The indicator fell by 6.6% in 2011 compared to the first term of the dynamic series, after which it increased by 2.6% in

2012 compared to the previous part of the series dynamic, in the case of sheep, the average weight of slaughter was 33 kg, with a range of variation from 30 to 35 kg (2011 respectively 2012). Evolution of the indicator it is one fluctuating, decreases by 11.8% in 2011 (compared to the first term of the dynamic series), followed by increases of 16.7% in 2012; for goats it appears the fluctuation of average weight at slaughter from 16-20 kg (2010 respectively 2012), the average of the period reaching 18 kg. Indicator performed strictly ascending during the analyzed period, subsequent annual increases - specific years 2011 and 2012 - being 9.4 and 14.3% respectively.

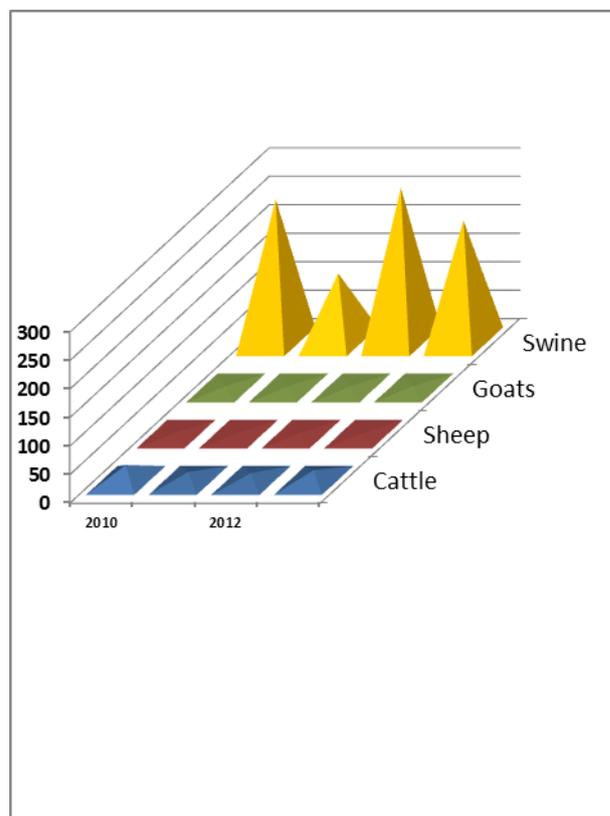


Fig. 2. Total meat production

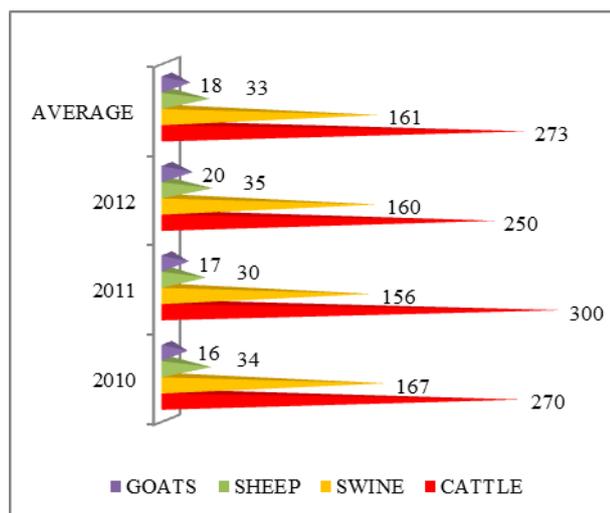


Fig. 3. Weight at slaughtering (kg / head)

CONCLUSIONS

Goiеști village by surface represents 1.06% of the total county and can be considered a medium to large sized village for Dolj County, given the fact that it discusses the existence of 114 administrative territorial units (municipalities, cities and common).

In the context of agricultural production, the village holds 1.10% of the total agricultural and county 0.91% of the arable land.

If we relate total production for the livestock sector, to the situation of the county, we can emphasize the following weights: 1.10% of total meat production, 0.87% bovine meat production, 1.65% of pork; 0.35% in the production of sheep and goats;

For meat production - 238,1 t - is a higher number for pig meat (89.45%), the remaining species with low weights, as follows: 7.56% cattle, goats 1.61%, 1.38% sheep (fig. 4).

It is noteworthy the hard necessity of development of the livestock sector, both in terms of reinvigorating the workforce and improving the structure of race in terms of staff, so as to achieve proper operation of the existing potential, both in terms of natural and legally economic and social.

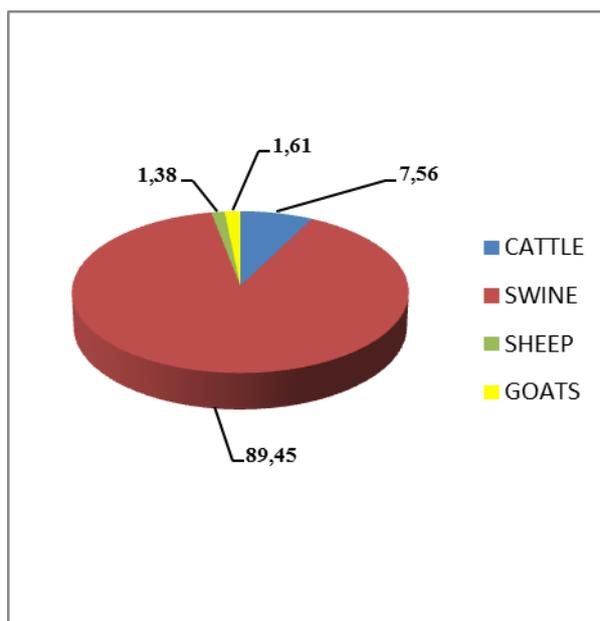


Fig.4. The structure of the production of meat, period average (%)

REFERENCES

- [1]Barbu C., Pânzaru RL, 2000, Agricultural Economics, Hyperion Publishing House, Craiova, Chapter 7, Part II, p 331-365
- [2]Pânzaru, R.L., Medelete, D.M, Stefan G., 2007, Elements of management and marketing in agriculture, Universitaria Publishing House, Craiova, Chapter 6, pp. 116-148
- [3]Stefan G., Bodescu D., Toma A.D., Pânzaru R.L, 2007, The economy and agri-food chain, Alpha Publishing, Iași, Chapter 3, pp. 53-157
- [4] City Hall Goiеști, Statistical Reporting Data, 2010-2012

ECONOMIC AND FINANCIAL ASPECTS OF ACTIVITY IN SC INAGRO L.L.C. - CRAIOVA, DOLJ

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Abstract

The unit was established in 2003, with the object of "growing plants of the field" - CAEN code 0111. When setting up the unit has had a share capital of 2,000,000 ROL, based in Craiova and Predesti branch in town. It operates 180 ha, which is grown mainly wheat and sunflower crops of maize, barley and oats are grown on small surfaces. The Unit has a number of 5 permanent employees, and during campaigns calling about 10 laborers. Heritage includes an administrative office, huts, warehouses, sector of mechanization, etc.. Based on the three categories of income (operating, financial and extraordinary) are formed farm's total revenue, which is as follows: 176 777 lei in 2009, 193,356 lei in the year 2010 to 109.4% in dynamics, 371 766 lei for 2011 (outrunning 2.10 times the reporting base) 247,299.7 lei period average (39.9% compared to 2009 - term of reference). Total operating expenses based on total material costs, personnel costs, adjustments and other operating expenses. Based on parameter values, remember earlier has been reached sequential levels of: 163 478 lei in 2009, 173,779 lei in 2010 (+6.3% dynamic) 210 371 lei in 2011 (+28.7% compared to the period reference) 210 371 lei for period average (11.7% in the dynamics). Gross profit is equal to current income as farm profit or extraordinary loss has not registered. The gross profit rate is equal to the current rate of profit as the company has not registered extraordinary profit or loss.

Key words: assets, capital, customers, equipment, landscape, providers

INTRODUCTION

In determining farm income distinction should be made between farm income and agricultural income. This difference shows that the level of holdings can be deployed and non-agricultural activities that can increase total income, with positive effects on farm viability. Regarding income from agriculture should be noted that the size depends on the production obtained, the market prices of agricultural products, inputs costs, interest on any loans taken out policies to support agriculture by the state, other economic factors, natural and biological agents that exert their influence on labor productivity and implicitly on agricultural income [3].

Costs of agricultural production is an economic category conditional on the production of goods, a manifestation of the law of value, directly linked to the process of obtaining goods and services.

Production costs are based synthetic indicator for assessing the profitability and economic efficiency of crop and livestock [1].

It is the extra profit made by companies from the fact that they earn more than they spend on sales to produce those goods. The total profit of a firm (Pr) is the difference between total sales (VT) and total production costs (CT):

$$\text{Pr} = \text{VT} - \text{CT}$$

Profit maximization implies to compare costs with revenues and analyze at what level of production, the profit will be maximized, and also which is this level of profit [3].

The budget is designed in the form of balance, it containing the revenue side and the expenditure side, also including financial results - namely profits and the distribution thereof.

While the budget is an instrument of the financial strategy of a producer, the balance reflects the results obtained during a financial year. Balance reflects the correlation between economic means and sources of their formation is composed of two distinct parts: active and passive. [2]

MATERIALS AND METHODS

Making the work involved stage in documentation based on the use of financial reporting data [4]. The data processing was performed by using comparisons over time and by providing structures for certain indicators used. The indicators were grouped into three categories homogeneous as follows: indicators of income, expenditure indicators and profitability indicators. The analysis covers the period 2009-2011, and using period average.

RESULTS AND DISCUSSIONS

Indicators of income. Table 1. presents the level of income indicators for the period 2009-2011.

Table 1. Annual revenue (lei)

CRT. NO.	SPECIFICATION	2009		2010		2011		AVERAGE	
		EF.	DIN.	EF.	DIN.	EF.	DIN.	EF.	DIN.
1.	Production sold	-	100	-	-	8.614	100	4.307	50,0
2	Revenue from sale of goods	98.079	100	96.051	97,9	208.445	212,5	134.191,7	136,8
3	Income from subsidies	113.321	100	41.761	36,9	133.414	117,7	96.165,3	84,9
4	Net turnover (1+2+3)	211.400	100	137.812	65,2	350.473	165,8	233.228,3	110,3
5	Profits due to cost of production in progress	34.634*	-	55.528**	-	21.267**	-	14.053,7	-
6	Other income	-	-	-	-	-	-	-	-
I	Income from operations (4+5+6)	176.766	100	193.340	109,4	371.740	210,3	247.282	139,9
7	Income from interest	11	100	16	145,5	26	236,4	17,7	160,6
8	Other financial income	-	-	-	-	-	-	-	-
II	Financial income (7+8)	11	100	16	145,5	26	236,4	17,7	160,6
III	Extraordinary income	-	-	-	-	-	-	-	-
IV	Total revenues (I+II+III)	176.777	100	193.356	109,4	371.766	210,3	247.299,7	139,9

* falling revenues in balance D subtracted from net sales;

** incomes falling in the balance C is added to net sales;

Based on the indicators listed was determined the turnover this averaging 233,228.3 lei (10.3% compared to 2009-211400 lei). The extreme values of the indicator were 137 812 lei in 2010 (-34.8%) and 350,473 lei in 2011 (+65.8%).

Revenue from cost of production in progress varied from 21267 lei in 2011 to 55528 lei for 2010. Average for the period was 14,053.7 lei, since the 2009 value of 34364 lei has been assigned the outstanding balance of D and not C, as in 2010 and 2011.

The farm has not registered other income categories for operating activities and operating

The first indicator of revenue is the production sold. This indicator appears only in the year 2011 - 8614 lei, as such period average is 4307 lei (50.0% - in dynamics).

Revenue from sale of goods ranged from 96 051 lei in 2010 to 208 445 lei in 2011, the average period being 134,191.7 lei. The dynamics is lower than in 2010 (97.9%) for average and over-unit 2011 - advancing of 1.36 and 2.12 times respectively of the reporting term - 2009 (98 079 lei).

Revenues from grants accounted for 113,321 lei in 2009, 41,761 lei in 2010 (-63.1% in dynamics), 133,414 lei in 2011 (17.7% of the reporting) and 96153.3 lei period average (-15.1%).

income as a result achieved: 176,766 lei in 2009, 193,340 lei for 2010 to 109.4% in dynamically 371 740 lei for the year 2011 to 210.3 % 247 282 lei for period average (39.9%). Unit recorded income from interest of 11 lei in 2009, 16 lei in 2010 and 26 lei in 2011, therefore the average period was 17.7 lei. Dynamics outlines the terms of reference outruns of 1.45, 1.60 and 2.36 times in 2010 and the average period of 2011.

Since the unit is no longer achieved other financial income, financial income is equal to the interest earned. It should be noted that the

firm has not recorded during the period, any extraordinary income.

Based on the three categories of income (operating, financial and extraordinary) is constitute the total revenues for the farm, which is as follows: 176 777 lei in 2009, 193,356 lei in the year 2010 to 109.4% in dynamics, 371 766 lei for 2011 (downgrade 2.10 times in the basis of reporting) 247,299.7 lei the average period (39.9% compared to 2009 - term of reference).

Spending indicators. Table 2. presents the indicators of expenditure for the period 2009-

2011. Expenses with raw materials and consumables ranged from 88,689 lei in 2009 to 125,756 lei in 2011, while the average period was 107 323 lei.

Dynamic ascending trend of the indicator underlines, the overtaking of reference terms: 1.21 times in 2010 and the period average, 1.41 times in 2011. Other materials expenses appear only for the year 2011 - 489 lei, something that leads to an average for the period of 245.5 lei (50.0% in dynamics).

Table 2. Spending indicators (-lei-)

CRT. NO.	SPECIFICATION	2009		2010		2011		AVERAGE	
		EF.	DIN.	EF.	DIN.	EF.	DIN.	EF.	DIN.
1	Spending with raw materials and consumable	88.689	100	107.524	121,2	125.756	141,8	107.323	121,0
2	Other materials expenses	-	-	-	-	489	100	245,5	50,0
3	Expenses (water, energy)	-	-	-	-	-	-	-	-
4	Total expenditures for materials and goods (1+2+3)	88.689	100	107.524	121,2	126.245	142,4	107.486	121,2
6	Salaries	26.250	100	27.267	103,9	37.135	141,5	30.217,3	115,1
7	Insurance expenses	7.019	100	7.341	104,6	9.157	130,5	7.839	111,7
8	Personnel expenses (6+7)	33.269	100	34.608	104,0	46.292	139,1	38.056,3	114,4
9	Adjustments	11.331	100	840	7,4	2.160	19,1	4.777	42,2
10	Expenditure on external services	10.429	100	9.768	93,7	18.930	181,5	13.042,3	125,1
11	Other taxes, fees and similar payments	499	100	539	108,0	394	79,0	477,3	95,7
12	Other expenses	19.261	100	20.500	106,4	16.350	84,9	18.703,7	97,1
13	Other operating expenses (external services, other taxes - taxes, contributions, donations compensation, assets transferred) (10+11+12)	30.189	100	30.807	102,1	35.674	118,2	32.223,3	106,7
I	Total operational expenses (4+8+9+13)	163.478	100	173.779	106,3	210.371	128,7	182.542,7	111,7
11	Interest expense	-	-	-	-	-	-	-	-
12	Other financial expense	-	-	-	-	-	-	-	-
II	Financial expenses (11+12)	-	-	-	-	-	-	-	-
III	Extraordinary expenses	-	-	-	-	-	-	-	-
IV	Total expenditure (I+II+III)	163.478	100	173.779	106,3	210.371	128,7	182.542,7	111,7

Due to this situation, the expenditure was identical to materials in 2009 and 2010 by the costs of raw materials and consumables, but they have reached the level of 126 245 lei in 2011 (42.4%). Under these conditions the average period ahead of 1.21 times the based of reporting (107 486 to 88 689 lei).

Wages have risen from 26250 lei in 2009, 3.9% in 2010 (27267lei) and 41.5% for 2011 (37135lei). The same tendency are present for average period which extends beyond compared to 15.1% - 30217.3 lei.

Insurance spending have averaged 7839 lei (11.1% of the reporting), with extremes of 7019 lei in 2009 and 9157 lei in 2010 (30.5%). In 2010 the indicator has exceeded the benchmark by 4.6% - 7341 lei.

Based on salaries and insurance were determined personal expenses. This indicator

has values upward for the period under review from 33,269 lei in 2009 to 46 292 lei in 2011. You can discuss the increasing trend of the indicator highlighted by overcoming reference, as follows: 4.0% for 2010 (34608 lei), 14.4% of the average period (38056.3 lei) and 39.1% in 2011. Another item of expenditure appears as the adjustments on assets, an indicator that has a net downward trend. The year 2009 is characterized by a value of 11331 lei adjustments, value drops to 840 lei in 2010 and 2160 lei for the year 2011. Under these conditions the average period reached 4777 lei (42.2% of the reporting). Dynamics is dominated by indices below par - 7.4% in 2010 and 19.1% in 2011.

Expenditure on external services were 10,429 lei in 2009, fell by 6.3% in 2010 (9768 lei) increased by 81.5% in 2011 (18930 lei), while

the average term exceeded 1.25 times the reporting deadline - 13042.3 lei.

With regard to other taxes, fees and similar payments, it can be seen that they ranged from 394 lei in 2011 to 539 lei in 2010, while the average period was 477.3 lei. In the dynamics can be observed variation made with fixed base indices: subunit values for 2011 and the period average (79.0 and 95.7% respectively), values above par in 2010 to 108.0%.

For other expenses average is 18703.7 lei (2.9% of the reporting period), with values sequential variables: 16350 lei in 2011 (-15.1%), 19261 lei in the first term of the dynamic series (2009), 20,500 lei in 2010 (+6.4% compared to the reporting deadline).

Following the values quoted for the last three indicators were determined other operating expenses which have been: 30189 lei in 2009, 30,807 lei for 2010 to 102.1% lei 35674 - 118.2%. With these values we determined the average period was 32223.3 lei, which in dynamic was exceeded by 6.7% reporting database.

Total operating expenses based on total material costs, personnel costs, adjustments and other operating expenses. Based on parameter values, remember earlier, it was sequential levels: 163 478 lei in 2009, 173,779 lei in 2010 (+6.3% dynamic) 210 371 lei in 2011 (+28.7% compared to the period reference) 210 371 lei for period average (11.7% in dynamic made).

These values noted ascending trend of operating expenses for the period analyzed. In terms of total spending, it is noteworthy that it is identical to the previously indicator - total operating expenses - not recorded as financial expenses and any extraordinary expenses.

Profitability indicators. Table 3. present the level of profitability indicators for the period 2009-2011.

Operating profit is characterized by an average of 64739.3 lei sequential annual value levels resulting from 13288 lei in 2009, 19561 lei specific in 2010 and 161,369 lei for 2011.

These values underlines ascending trend of the indicator, which is beneficial for the work done. Financial profit was 11, 16 and 26 lei for the three components of the dynamic series 2009,

2010 and 2011 respectively (45.5 and 136.4% in dynamics to the reporting deadline).

Due to this situation, the average period reached 17.7 lei, ie 160.6% fixed base index value.

Current profit appears as the sum of operating profit and financial profit. So talk about values 13299 lei in 2009, 19,577 lei in 2010, 161,395 lei in 2011 and 64757 lei for the period average. The dynamics is characterized by values exclusively supraunitary of component index: demotions of the reporting period in 2010, 1.47 times, 4.86 times and 12.13 times the average period for 2011.

Gross profit is equal to current income as farm profit or not registered extraordinary loss. Company did not pay income tax, but paid "other taxes" that were located at 6500 lei in 2009, 3225 lei in 2010 (50.4% dynamic) 10515 lei in 2011 (61.8%). Under these conditions the average period was 6746.7 lei, which exceeded by 3.8% based reporting.

Net profit is characterized by an average of 58010.3 lei, while the extreme values of the indicator occurred in 2009-6799 lei and 2011-150880 lei.

The dynamics is strictly ascending, advancing the reporting term being 2.40 times in 2010 (16352 lei), 8.53 times and 22.19 times the average period in 2011.

Operating profit rate was 8.13% in 2009, 11.26% in 2010, 76.71% in 2011 and to 35.47% for the period average.

Evolution in time of the indicator is in the form of an upward trend, advancing the reference term in 2010 1.38 times, 4.36 times and 9.43 times the average period for 2011.

It can be seen that the current profit rate is slightly higher than the previous indicator, the annual growth of 0.01% (except the average period is identical to the one shown above).

The gross profit rate is equal to the current rate of profit as the company has not recorded extraordinary profit or loss.

The last indicator of profitability refers to the net profit rate.

It may be noted that this indicator has averaged 31.78% (7.64 times outrunning the reporting in the basis of), with extreme values of 4.16% for 2009 and 71.72% in 2011.

The consequence of this situation dynamics is strictly upward benchmark term being exceeded 2.26 times in 2010 to 17.2 times in 2011.

Table 3. Profitability indicators

CRT. NO.	SPECIFICATION	U.M.	2009		2010		2011		AVERAGE	
			EF.	DIN.	EF.	DIN.	EF.	DIN.	EF.	DIN.
1	Operating profit	Lei	13.288	100	19.561	147,2	161.369	12,14 times	64.739,3	4,87 times
2	Financial profit	Lei	11	100	16	145,5	26	236,4	17,7	160,6
3	Current profit (1+2)	Lei	13.299	100	19.577	147,2	161.395	12,13 times	64.757	4,86 times
4	Extraordinary profit	Lei	-	-	-	-	-	-	-	-
5	Gross profit (3+4)	Lei	13.299	100	19.577	147,2	161.395	12,13 times	64.757	4,86 times
6	Income tax	Lei	-	-	-	-	-	-	-	-
7	Other taxes or levies	Lei	6.500	100	3.225	49,6	10.515	161,8	6.746,7	103,8
8	Net profit (5-6-7)	Lei	6.799	100	16.352	240,5	150.880	22,19 times	58.010,3	8,53 times
9	Operating profit rate	%	8,13	100	11,26	138,5	76,71	9,43 times	35,47	4,36 times
11	Current profit rate	%	8,14	100	11,27	138,5	76,72	9,42 times	35,47	4,35 times
12	Extraordinary profit rate	%	-	-	-	-	-	-	-	-
13	The gross profit rate	%	8,14	100	11,27	138,5	76,72	9,42 times	35,47	4,35 times
14	Net profit rate	%	4,16	100	9,41	226,2	71,72	17,2 times	31,78	7,64 times

CONCLUSIONS

- in total revenue structure prevailing operating income by 99.99%, financial income was only 0.01% of the total. Components are included in operating revenue ratios: 94.33% turnover, 54.26% of production sold, 38.88% income subsidies, 5.68% revenues from production costs, 1.74% output sold - Figure 1;
- total expenditure is equal to operating expenses and material costs prevailing in their structure - 58.88%, followed by personnel costs - 20.85% Other operating expenses - 17.65% and adjustments - 2.62% - fig.2;
- the unit record operating profit and financial profit - 64739.3 lei 17.7 respectively, which make current profit - 64757 lei;

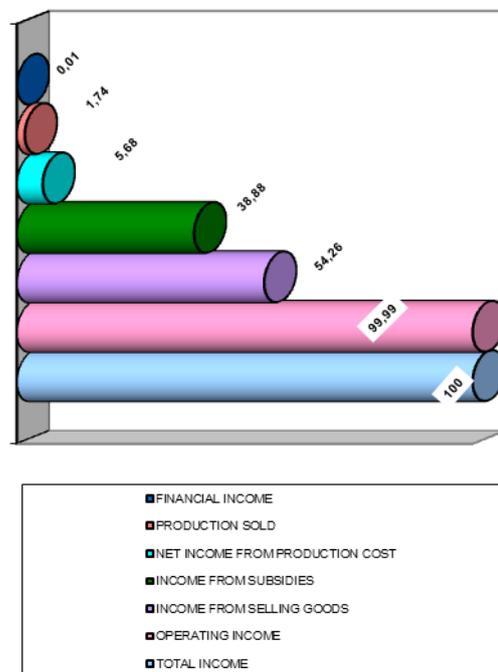


Fig. 1. The ratio of total income and its main components (%)

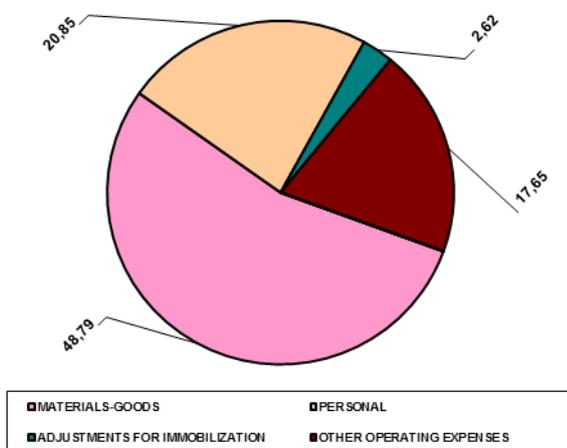


Fig.2. Total expences structure (%)

d. given that the unit has not reported profit or loss are found extraordinary similarity between current income and gross, the latter decreasing by taxes paid, so that net profit reached 58010.3 lei;

e. with outstanding results is remarkable year 2011 year was adequately supported by grants convenient, but also income from the sale and production of goods sold.

REFERENCES

- [1]Barbu, C., Pânzaru, R.L., 2000, Agricultural Economics, Hyperion Publishing House, Craiova, Chapter 5, Part I, pp. 71-93;
- [2]Pânzaru, R.L., Medelete, D.M., Ștefan, G., 2007, Elements of management and marketing in agriculture, Universitaria Publishing House, Craiova, Chapter 5, p 93-115;
- [3]Ștefan, G., Bodescu, D., Toma, A.D., Pânzaru, R.L., 2007, the economy and agri-food chain, Alpha Publishing, Science, Chapter 8, p 267-315;
- [4] x x x - SC INAGRO Ltd, accounting data, 2009-2011.

BUSINESS ETHICS AND ENVIRONMENTAL PROBLEMS

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Abstract

In this paper researches a role of business ethics in the environment protection, along with respect of the sustainable development modern concept. The modern industry (and agro-industry) and a factory (farm) work development, together with great migrations of people across the oceans and continents, especially during the nineteenth and the beginning of the twentieth century, has led to great changes in a way the people have worked and done business. The economy has surpassed from agriculture and family cooperatives to urban, industrial organizations. These changes impact to individuals, workers, families, a community and the environment, as well as an ascent of a new class of wealthy business leaders, but also new poverty zones, have led to an occurrence of an enhanced ethical debate, not just among an academic community, but among writers, politicians, priests, poets and populists, too. The sustainability fundamental principles in perspective of a man's environment protection comprise an effective management of physical resources, in a way they to be preserved for the future. All bio-systems observe as the one with limited resources and a final capacity, and thereby also the sustainable human activity must act at the level which does not jeopardize the endangered species health.

Key words: business ethics, ecology, environment, sustainability

INTRODUCTION

With new globalization challenges appearance, a significant interest has been directed to development of new ways of solving different business impacts in the society. Many of those impacts are far-reaching and profound. Let's name some of them, like:

-Environment pollution, caused by production, transport and using products like automobiles, refrigerators or newsprints.

-Increasing problem of waste disposal and its management as a result of an excessive products packing,

-Devastating consequences for an individual and the local communities, due to domestic companies closing, decrease of their size and number of employees.

-Erosion of local cultures and the environment, due to a mass tourism penetration in places like: Mallorca fishing places, Alpine communities in Switzerland, as well as the ancient Roman monuments.

According to such problems suggest radical changes in formulating the business goals. After *The Earth Summit*, held in 1992 in Rio

de Janeiro, a concept had imposed as the one which should be widely applied (although not unanimously accepted). It is about a new conceptual frame for evaluation, not only business activity, but also industrial and social development in general [2]. It is the *sustainability concept*. The sustainability has become a customary expression in rhetoric which refers to the business ethics, so it has been widely used by corporations, governments, consultants, scientists, etc. Despite of its wide use, the sustainability is the expression which use and interpret in different ways [3]. Probably the most often use of the sustainability expression regarding the sustainable development, which defines in the following way: *The sustainability development is development which satisfies the needs of today, without jeopardizing the future generations in satisfying their needs* (The World Commission on Environment and Development, 1987). This definition, however, represents only a basic idea of widely contested term, which has been also a subject of series of different conceptualizations and definitions. Therefore, with all the caution

against any unconditional acceptance of any interpretation, on a basic level, it seems that the sustainability primarily refers to the system maintenance, as well as insurance of a fact that our acting does not affect on systems (for example Earth or biosphere) in a way their long-term sustainability to be jeopardize. Focusing at the sustainable development and the future generations' potential to satisfy their needs, the sustainability also faces with cogitations on inter-generation capital, i.e. the equality between generations. For a long time the sustainability concept, to a large degree, has remained a synonym for the human environment sustainability. Recently it has been, although, enlarged, not only to the considerations on the environment, but also to the economic and social development [4]. This extension of the sustainability concept has appeared primarily due to a fact that it is impractical, even impossible, to analyze the environment sustainability without consideration of the social and economic aspects of relevant social communities and their activities. The second argument for this consideration continuation is, if capital should be expanded to the future generations, then it is logical to expand it on everyone in the current generation. So, one of the primary goals set by the World Commission on Environment and Development is extermination of the world poverty and inequality. As it can notice, the sustainability can observe through three components: ecological, economic and social. It refers to the next definition: The sustainability refers to long-term system maintenance in accordance with the human environment, economic and social development. Although this definition serve for determining the basic content of the sustainability concept, it is obvious that the sustainability as a phenomenon represents a specific goal that should be achieved. Shaping the sustainable development as a goal of an enterprise's business activity has been the most completely expressed in a term "triple bottom line". The „triple bottom line“ is a term, formulated and strongly advocated by John Elkington, director of the Consulting Company for Sustainability Strategy and

author of many esteemed books on corporative environment. His point of view to this concept is based on a fact that it represents an idea that business does not reflect in maximizing the economic value, but he added the expanded set of goals, which implied including the environment and wider social community. From this perspective should be clear why the sustainability is a new goal, potentially important for the business ethics.

MATERIALS AND METHODS

The basic research task of this paper is in perceiving the role of business ethics in the environment protection. In realization of the research task was used a desk data research, which refers to the mentioned phenomenon. This research implies using data from the official resources: international organizations data; data from domestic and foreign literature; internal data base of the Institute of Agricultural Economics, Belgrade. Since the focus of the topic, which processes in this paper is on business ethics and the environment protection issues, it is natural that research will pay the special attention to them, the more the areas are not sufficiently processed, investigated or are partially analyzed, so the prevailing opinions, as it seems, should subject to a strict, on reliable scientific base, based check. In that way, we hope, will clarify many dilemmas and point out clear ways which lead to efficient balancing between economy, social development and the environment protection.

RESULTS AND DISCUSSIONS

The fundamental sustainability principles in perspective of the human environment protection comprise effective management of physical resources, in a way to be preserved for the future. All bio-systems observe as the ones with limited sources and a final capacity, and thereby also sustainable human activity must act at the level which does not jeopardize the endangered species health. Even at the most basic level, these problems point out to a need to remove certain number of critical business

problems, like impacts of industrialization to biological diversity, using non-renewable resources, like oil, steel and coal, as well as the production of harmful environment pollutants. Consequentially, the ecological factor gets its significance, which creates a demand for special consulting services regarding projecting/installing the equipment for reduction/prevention of pollution [1]. Economic perspective of the sustainability has originated from the economic growth model, which assesses the capacity limits of the planet Earth. The comprehension that continual growth of inhabitants' number, industrial activity, using resources and the environment pollution, can lead to a life standard reduction, has initiated the sustainability appearance as a way of thinking, which would insure that all future generation avoid the unfavourable position, due to activities and choice of the current generation. In time has grown an opinion on improvement of sustainability macro-economic comprehension. Implications of such opinion on the business ethics have appeared at different levels. Narrow concept of economic sustainability focuses especially at economic performances of the corporation. The management responsibility is only for development, production and market of those products, which ensure long-term economic performances of the corporation, without respect for the environment and the society requirements. The corporations which try to avoid income tax payment by subtle accounting tricks act in sustainable way: if they are ready for financing institutions which preserve the social environment and human surroundings (like schools, hospitals, police and judicial system), then they do not jeopardize one of the key institutional grounds of their corporative success. Accordingly, there form associations of researchers and activists of mutual interest (for example „International Pressure Group“, „Tax Justice Network“, etc.) on issues which serve for raising the awareness and stimulating actions against harmful influences of tax payment avoidance, tax competition and, so called, tax havens. Development of the social perspective related to the sustainability usually comes after the

ecological and economic perspectives and stays relatively new, as a phenomenon. Explicit integration of social problems into the business discourse about the sustainability could be seen as a phenomenon during the '90s, and, first of all, seems as an answer to a worry regarding the business activities influence on autochthonous communities in less developed countries and regions. Introduction of social reflection within the sustainability area has characterized a significant shift in this concept's interpretation. A key question in the social perspective is the one concerning the social justice. Regardless to an impressive progress of life standard, the UN, during 2005, had issued the *Report on Social Situation in the World*, which had identified a constant deepening of inequality on the planet. With 80% of the world gross domestic product, which belongs to one milliard people living in developed countries, and the rest 20% shares 5 milliard people who live in developing countries, as it is stated in the Report, was suggested that „solving the inequality must secure a social justice and better life conditions for all the people, which is unachievable in this moment, so the communities, countries and regions are still vulnerable to social, political and economic subversion“[5]. More concrete, in the Report is stated that there is „an increasing chasm among qualified and unqualified workers, the chasm among formal and informal economy, as well as significant differences in health care, education and opportunities for social and political participation“ [5]. Business, as one of the main starters of economic development, has been more and more present in such discussions. That is to say, fairer world, whether among rich urban consumers in the West and poor workers in developing countries, among the rich urban and rural poor, or among women and men, remains the essential issue of the sustainability social perspective. There remains an open question in which way should business respond to such challenge, but at least the goals got some explanations in last several years with declaration „The United Nations Millennium Development Goals“. These items, which will quote, represent the main social and

developmental challenge which upsets the world at the moment and articulate the specific goals and indicators of what should achieve until 2015. Eight „Millennium Development Goals“ are: to exterminate extreme poverty and hunger, to implement primary education, to promote equality of sexes, to reduce children death rate, to improve mothers' health, struggle against HIV/AIDS, malaria and other diseases, to insure the environment sustainability, to develop the global partnership for development. Although the UN had determined the goals, they, in effect, represent a government responsibility which should achieve them. Some of them have very direct implications for business, while the others refer to wider environment in which companies have to do business. In regard to this enlarged set of expectations, which put in front of business in accordance with the concept of „Triple Bottom Line“, there are many significant implications regarding a way in which should observe the business ethics. Aiming to achieve the sustainability in previously defined areas, maybe expects too much nowadays. There are negligible products, firms or industries for which could reliably claim that they are sustainable in the full sense of the word. However, with the concept of sustainable development widely promote governments, companies, non-governmental organizations and academic communities, which is obviously important in order to understand full implications and evaluate the business ethics application, at least according to potential contribution to sustainability.

CONCLUSIONS

Ethics in business world means adoption and respect of behaviour norms and moral values of the society in business. It is especially significant for countries in transition, in which are present a corruption, grey and black economy. There manifests as the business ethics. The business ethics is a system of business principles or values, which refer to business duties and obligations. It determines what is good and ethical in business and business communications from the business

moral point of view and what is bad and unethical. It also determines what is rightfully, i.e. unrightfully. Business behaviour therefore direct economic principles and legal regulations. It is, although, not enough. Each business communication opens a question of moral, ethical dilemmas. Moral behaviour is maybe not always profitable in short-term, but it is „the best“ investment for economic success in long-term. Besides, none of national economies can function without built-in legal, moral or other „stabilizers“. Modern democratic development requires a harmony of material and universal human values, in which the ethical values take very important place. This is because a man is not only economic factor, but an ethical creature, too.

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REFERENCES

- [1] Cvijanović, D., Mihailović, B., 2010, Značaj konsultanata u proizvodnji organske hrane u Srbiji, Međunarodna konferencija „Zdrav život“ 10. april 2010., Trebinje, u okviru V međunarodnog sajma turizma, ugostiteljstva i trgovine „Mediterranski dani – Trebinje 2010“, str. 99-106.
- [2] Cvijanović, D., Mihailović, B., Pejanović, R., 2012, Poslovna etika i komuniciranje, monografija, Institut za ekonomiku poljoprivrede, Beograd.
- [3] Dobson, A., 1996, Environment Sustainabilities: An Analysis and a Typology, *Environmental Politics*, 5(3), pp. 401-428.
- [4] Elkington, J., 1998, *Cannibals with forks: The triple bottom line of 21st century business*, Gabriola Island, BC Canada: New Society Publishers.
- [5] The Report of the World Social Situation, 2005, *The Inequality Predicament*, United Nations Publications, New York.

SUSTAINABLE MANAGEMENT-FEE COLLECTION MECHANISM FOR IRRIGATION AND DRAINAGE FACILITIES IN ISLAMIC LAW

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Abstract

Increasing the environmental stresses on water resources are causing countries to reconsider various mechanisms to improve water use efficiency. This is especially true for irrigation agriculture, a major consumer of water. The physical and hydraulic characteristics of the irrigation distribution system often form a major limit. Also the implementations of irrigation water fees are sensitive to physical, social, and religious beliefs, making it necessary to design allocation mechanisms accordingly. The purpose of this work is to study the water pricing mechanisms to improve cost recovery for irrigation and drainage facilities under the Islamic law and its impact on water saving. The study tries to find out if there is an irrigation water pricing system that better meets the social, economical, and environmental needs. Also the research tries to highlight Egypt's experience in dealing with the cost recovery in irrigated agriculture. The main findings to agree with Islamic law that cost recovery for irrigation and drainage services would be limited to those infrastructures that are used solely for direct irrigation and drainage and should ensure that at least the full operation and maintenance costs are recovered, because they reflect the service costs of providing farmers with irrigation water and ensuring acceptable drainage. When the pressure of demand on water resources is high and competition exists between uses of water, quota systems are imposed on agriculture. To get high cost-recovery rates, farmers should not only agree on the costs to be recovered but also see the fees collected are used to maintain and improve "their" system.

Key words: cost recovery, Egypt, water saving

INTRODUCTION

Problems of water management in agriculture are gaining increased importance worldwide. The implications of a rapidly increasing population on food demand, the environment and water availability are severe. Within this context water availability becomes an important reason in global development and issues of sustainable development and water management attract prominent attention. Per capita availability of water is declining rapidly in many regions of the world and in particular in Islamic countries because of a rapid population growth. Some of the countries in such regions move rapidly into a water scarcity and water crisis. Such alarming trends imply that issues of water availability transcend sectorial considerations and have important effects on a country's economic and social development. The social

dimension is yet another reason that comes into play as farmers have their own views of water that are derived from cultural, traditional and religious beliefs [1].

Being a gift from God, it could be implied the issue of pricing water itself, would be a controversial one in an Islamic community, given the way every individual thinks about water based on the Holy Book (Qura'an).

One of the main concepts of Islam is the economic integration between people with different income. As water is the most important of life, it should be the first on the list of economic integration priorities. The Qura'anic verse says: "*So life will not be a trade between the rich*". The previous verse is a good example of economic integration, and shows the importance of equity in resources management [2].

Most Islamic Scholars agree that water sources such as rivers, canals and springs are

public ownership and should be managed wisely for the welfare of the whole community. There is only one case where water can be privately owned and that is the full enclosure, the same way it can be enclosed in a jar or a pool [3].

Pricing of the service of developing, purifying, and delivering water may be another issue "Islam allows water providers to recover their costs not for water itself". Governments, municipalities, and contractors in the Islamic countries can recover their costs for collecting, storing, treating, and delivering water, and for treating wastewater. Currently, about 80 % of water consumed in the region is used for irrigation, although with rapid population growth and urbanization, not enough is available for domestic purposes [4,5].

Islamic principles are often not made the basis of water policy in most of the Muslim countries because until recently there was no need for nor was there any tradition in the Islamic history for water management and distribution. As water shortages meet with other stressors of present times such as population increase and climate change, there is a need to internalize the Islamic principles into water management strategies as they are a part of every other aspect of Muslim life [6]. Among various policies in dealing with the intensifying water stress, pricing mechanism has been given a high priority. Carrying out pricing mechanism, efficiency of water use and sustainable management of water resources has been high on the agenda of policy makers at all levels [7]. So the main target of this work is studying the irrigation water pricing mechanisms to improve cost recovery and its impact on water saving according to the Islamic law. Also the work will study in deep the Egyptian case.

MATERIALS AND METHODS

In order to set up this paper, the study adopted both descriptive and quantitative analyses. As regards data, the study depended on published and unpublished data, issued by the Ministry of Agriculture and Land Reclamation

(MALR); Ministry of Water Resources and Irrigation (MWRI) of Egypt; World Bank reports; and Food and Agriculture Organization of the United Nations (FAO). The influence of irrigation cost recovery was evaluated. Also, using a combination of field studies and surveys of the relevant literature as well as the authors' observations, the authors built up a picture of some key points and recommendation for water saving

RESULTS AND DISCUSSIONS

Water resources situation in Islamic countries

Most Islamic countries are situated in regions with similar agro-climatic conditions (arid to semi-arid) and with the most water scarcity in the world. Natural water resources are limited, fragile, and threatened. Freshwater is derived from rainfall that either recharges groundwater aquifer systems or is impounded in artificial reservoirs, where possible during rainy season, to be used throughout year. Huge freshwater bodies like big rivers and lakes are limited; freshwater supplies are unequally distributed, unequally shared, and irregular in time and space, creating water shortages in most of the countries [8].

Water resources development and planning has been the responsibility of governments in several Islamic and African countries but the governments did not have the financial and institutional ability to install, operate and maintain the water facilities. This has led to facilities and water infrastructures remaining poorly maintained and even collapsing such performing the sector as a whole remained grim. Despite moves being taken by some countries, there is still lack of appreciation to accepting water as well as social importance has an economic value which must be treated in all its competing uses. This has affected sustainability as funds for operation, maintenance, expansion and rehabilitation of projects in particular for irrigation purposes have not been fully recovered. Thus the issue continues to be one of the major underlying problems constraining water resources development [9].

Water pricing and cost recovery

Water fees are collected from farmers for two main reasons. The first is to cover the operation and maintenance (O&M) cost so the project is financially sustainable. Often, fees will also need to include a charge for the cost of capital needed to erect the project. This charge for capital is important for future irrigation investments. The second objective involves pricing to encourage farmers to use less water per unit of output or produce greater net economic returns per unit of water, or both. Historically, the first objective has been paramount, but as water scarcity increases, the water use efficiency objective is likely to grow in importance and be given a higher priority [10].

The current water prices in the most Islamic countries are still low, with relative differences between countries. The average share of water costs is way below 10% when considering all countries on which data is available. In countries where the prices are still low such as Pakistan and Syria, even doubling the current prices, which would be very sensitive from the political standpoint, would keep the share of water costs below 5 to 10%. Within countries, the share of water costs varies between regions as well as from one crop to another. In Tunisia, the share varies from 7% for winter irrigated crops, such as cereals and forages, to 30% for summer crops, such as vegetable crops and fruit trees. Whereas in Morocco, the share of water costs to variable costs varies from 8 to 33% with a mean in all irrigated schemes of 20% [1].

As mentioned before, these costs should be identified based on the concept that water is free under Islamic law and water tariffing has to never mean for selling water. It has a means of recovering part of the cost of service. Therefore, transferring and distributing irrigation water to each farm needs irrigation infrastructure and improvements for which costs for construction and/or reconstruction and O&M inevitably incurred.

Cost recovery mechanisms

There is no one easy means to improve cost recovery. However, many countries have

improved cost recovery through basic irrigation reforms. The reforms varied with the irrigation system type, management structure, and government policies and institutional arrangements [11]. For instance, O&M of irrigation projects can become more efficient by setting up mechanisms that encourage farmers' participation and in this way willingness to pay of farmers is increased, the quality of services is improved, and irrigation projects become self-sustained. The following are the most common ways of defining charges and their differentiation according to uses and users [4, 10, 12, 13]:

1. Area-based charge: the irrigator is charged according to the area irrigated, based either on: (i) the area owned; or (ii) the area cropped (declared by the farmer or assessed by the agency).
2. Crop-based charge: the charge is based on area and type of crop. Differentials may be justified by crop priority (e.g. Cereals for food security) or water diverted or consumed by crop or its value.
3. Volumetric charge: water is charged, based on diversions to a user or group of users (bulk water pricing). Metering is necessary but volume may be represented by time or the number of 'turns', provided discharges are more or less stable and predictable.
4. Quotas-based charge: its allotments often are used in these situations to mitigate equity issues or resource management issues; water conservation that arises with a water market or marginal cost pricing. By allowing quota allotments to be traded, the water authority can address equality concerns while promoting efficient allocations.
5. Market-based charge: the price of water is determined in a market where allotments can be traded (within season, seasonally or permanently). If the market is regulated, the regulator may set the price, set price limits, serve as broker, etc. (As in the California Drought Bank). To operate effectively, water markets need a well-defined structure of water rights, a clear and comprehensive set of rules for

trading, an entity to manage water delivery, and a judicial body to oversee trading activities and resolve disputes. They also need a well-developed conveyance system for transporting water to all participants.

Each method has its advantages and disadvantages, notably the ease with which charges can be calculated, justified and completed. Another modalities may also vary: for instance, charges may vary by season, be paid before or after cropping, in one or more instalments, in cash or in kind, etc.

Market-based price mechanism is rejected according to the Islamic law because it considers water like a good, whereas, most of the other mechanisms are acceptable provided for provision of services or improvements.

Egyptian case study

Egypt has no history of charging or pricing for water as same as most Islamic countries. Major infrastructures and facilities of the irrigation and drainage (I&D) system such as dams, barrages, pumping stations, levees, main canals, and drains are funded, operated, maintained, and rehabilitated under the government budget allocated to the Ministry of Water Resources and Irrigation (MWRI). Egyptian irrigation law needs cost recovery from beneficiaries for erecting mesqa and the field pipe drainage system improvements. The legal framework for forming Water Users Associations (WUAs) and cost recovery of mesqa construction costs was fully proved by the Law 12/1984 amendments and its 1995 by laws “These laws were drafted following the rules of Islamic law”. It allows establishing WUAs and allows the recovery of mesqa construction costs.

(a) Cost recovery for traditional land (nonimproved)

Today, farmers in Egypt pay very few taxes relative to their incomes. Farmers with three acres or fewer of land and no other source of income are free from land tax and other taxes that are attached to agricultural land tax. In all cases, these exemptions do not apply if the taxpayer has other sources of family income. To get an exemption, however, farmers must

apply to their local authorities each year and go through an extensive bureaucratic process. As a result, most farmers pay their land tax whatever the size of their holding.

Table 1 presents the average costs the farmer pays per acre of agricultural land whether it is in the form of land taxes and other duties. Charges for water services had not been introduced [14]. Irrigation pumping is an individual activity for each farmer.

Table 1. Average farmer’s contribution to irrigation water management in nonimproved old lands.

Irrigation management activity	Costs (LE/Acre/year)
Cleaning field ditches (marwas)	11
Desilting field canals (mesqas)	13
Cleaning field drain	15
Desilting private field drain	17
Capital cost subsurface drainage	35
Land tax	30
Total	121

Note: US\$1= LE 6.90 (2013)

(b) Cost recovery for irrigation systems in old improved lands

The cost recovery for the mesqas and pumping stations in Improvement Irrigation Project (IIP) areas forms about 86 percent of the total cost of improvement. The remaining 14 % goes to the improvement in the branch canals that farmers are not repaying under the existing legislation.

The payment for mesqa investment, which is expressed as most incremental income charged to irrigation improvements, varies between 15 and 25 % [15].

This shows the ability of beneficiaries to pay, and it also shows that farmers have a strong incentive to participate in the IIP. O&M costs are the responsibility of farmers located downstream from the delivery point. Failure to fulfill this obligation results in the work being undertaken by MWRI and charged to the farmers on a general average value plus a 10 % administration charges.

(c) Cost recovery for irrigation systems in new lands

In the new lands, the government constructs the main parts of the irrigation system,

including main regulators, main pumping stations, drainage reuse stations, main canals, and drains at no charge. Farmers are charged for the investment costs for all infrastructures located downstream of the booster pumps that draw from distributary canals, which serve between 100 and 200 acres. Such investments may be undertaken independently at the farmers' expense or by the government with cost recovery according to the established rules [16].

(d)The impact of fee collection mechanism and pricing

Based on the study, the Irrigation and Drainage Law No. 12 of 1984 was amended to clarify and consolidate farmers' irrigation/drainage infrastructure. The Law clearly describes the cost of reconstruction of tertiary and on-farm irrigation/drainage infrastructure should be fully collected from farmers over a 20 year period with no interest charged. The cost of reconstruction of the tertiary and on-farm irrigation/drainage infrastructure can be collected with land tax [12]. Several studies by International Irrigation Management Institute [17] measured the impact of different pricing and fee collection alternatives on the agricultural sector in terms of irrigation water used and farm income. Three pricing schemes were tried. First, a fixed rate of LE 70 per acre, irrespective of crop or water use, resulted in a fall in farm income of 4.5 % but had no effect on the choice of crop or technology. Second, an area-crop-based charge, proportional to the calculated average water consumption of each specific crop, resulted in a 2.4 % fall in farm income. The demand for irrigation was water reduced by 3.5 % and the returns to water increased by 2.7 %. Third, a volumetric charge based on the quantity of water delivered resulted in almost identical impacts as those got in the second case. The key factor explaining the different responses appears to be the availability of crops that farmers can choose to grow [18].

(e)Short summary

Fig. 1 presents distributing cost recovery items according to the duties of improvements under the Egyptian law. Farmers are

responsible for O&M of the improvements provided by MWRI at the tertiary-canal level. But the prevalent case is one in which MWRI is entrusted with the O&M; then, land taxes are levied at LE 30 per acre/year (on average), which accrue to local governments at a collection efficiency of 60-75 %. The cost currently incurred by farmers for irrigation (pump rental, tertiary-canal O&M) is 5-10 % of the farm budget (reaching 15 % for farmers growing sugarcane). An average fee of LE 85 per acre/year is estimated to be acceptable to meet the full O&M costs for irrigation services.

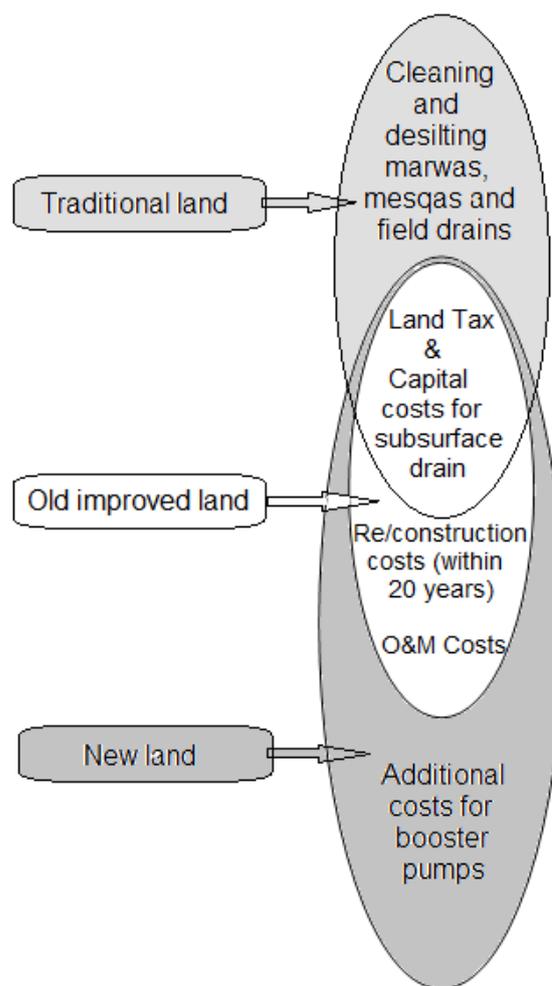


Fig.1.Distribution of cost recovery items in Egypt.

The collection rate of O&M cost for irrigation remains low because cost recovery is still a new concept and it is a transitional period in

Egypt, the Government kindly provides subsidies to ease the farmers' burden.

The Water Boards Project is testing ways to transfer water management responsibilities at the secondary level of the irrigation system from the MWRI to user organizations. This would reduce the government's contribution to O&M costs about 50 %. The Project will be testing new organizational arrangements that fuse investment and operational functions managed by MWRI agencies with user organizations that operate and maintain the irrigation network below the secondary-canal level.

Key factors for reducing water use

To encourage farmers to useless irrigation water per acre, water charges have to be related to water that farmers receive. Thus, volumetric water pricing should be considered when reducing water use per acre is the major concern.

In cases of high volumetric measurement costs, area-crop or area-technology based charging methods can be considered as a second best approach if they can be designed to influence water use.

Another possible combination is area-technology-based charge. Although it has not received much attention, theoretically it should promote selected irrigation technologies. The basic idea is similar to area-crop-based charges, with farmers using water-saving technology paying lower per acre water charges. For example, drip and sprinkler irrigation allow better water control and more output per unit of water delivered than flood irrigation.

Therefore, a higher per acre fee could be levied on farmers not using these technologies to encourage them to switch. Also, if the government supports farmer by introducing the drip and sprinkler irrigation facilities with low capital cost, it can push them to switch. This step will lead to save more water that can help the government to expand the agricultural area.

CONCLUSIONS

The Muslim world cannot afford to waste a single drop of water. Governments should

urgently implement sustainable water management policies which rationalize demand to ensure more efficient use. This can be achieved by attaching an economic value to water, measured by the value of the end product from each drop. Governments should implement water efficiency measures, shift from irrigation by flooding to more efficient irrigation systems, introduction of crop varieties that are resilient to salinity and aridity, recycle, treat and reuse wastewater, and develop affordable technologies for water desalination.

It will not be acceptable to most farmers particularly in nonimproved areas to introduce an extra fee for irrigation and drainage services other than land tax. Cost recovery for irrigation and drainage services would be limited to those infrastructures that are used solely for direct irrigation and drainage. Cost recovery should ensure that at least the full O&M costs are recovered, because they reflect the service costs of providing farmers with irrigation water and ensuring acceptable drainage.

The area pricing system that accounted for 60% of the sample studied by Bos and Wolters [19] modified according to the crop or irrigation techniques. It does not encourage water saving for a given choice of crop or irrigation technique, but it does have more effect than the area pricing system on the choice of which crops to irrigate or which irrigation technique to adopt. It can be used to discourage to irrigate certain crops for example, by applying a higher price to crops that consume a large volume of water (such as rice and sugarcane in Egypt).

When the pressure of demand on water resources is high and competition exists between uses of water, quota systems are imposed on agriculture. They then coexist alongside a pricing system whose only objective is to pay for the services of the water provider and possibly for the water itself. Quotas guarantees a limit to consumption which will not be exceeded, at least if the penalties and the laws ensure that it is followed.

To get high cost-recovery rates, farmers should not only agree on the costs to be recovered but also see the fees collected are used to maintain and improve “their” system. Having the fees collected go back into the general revenue fund of the state or federal government, provides farmers with a strong incentive not to pay fees. One good approach is to have the water supply entity or the WUA collect and keep most of the fees for use in “their” system.

Mostly, the cost of water represent 10 -20% of the production costs for most crops. As for the vegetable crops, they may be as low as 5%. Might such costs would have a tangible impact on the production, they should be increased (double or more); a trend which is now favored in most countries. In such a case, the farmer will find ways to avoid cultivating the high water-consuming crops.

Since crop charges indicate to the benefit received, it is also recommended the basis for setting service charges to beneficiaries should be crop-related, and reflect water consumption of the crop. Beneficiaries should also have the right to claim if remission of rates in case of crop failure.

There are many factors that might affect the disfavoring of charging for irrigation water. There are economic reasons, as many people are under the poverty line. There are also cultural reasons, as Egyptians take pride in the River Nile, paying for its water will never sound like a pleasant idea to them. However, what might sound possible is charging penalties for landowners who violate the law by cultivating rice or sugarcane, or charging costs for irrigation and drainage for strengthening improves infrastructure.

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REFERENCES

- [1]Bazza, M., Ahmad, M., 2002, A comparative assessment of links between irrigation water pricing and irrigation performance in the Near East. Conference on irrigation water policies: Micro and Macro Considerations. Agadir, Morocco, 15-17 June
- [2]Farouki, N., Biswas, A., Bino, M., 2002, Water management in Islam, IDRC, United Nations University Press
- [3]Caponera, D.A., 1985, Patterns of cooperation in international water law: Principles and institutions. *Natural Resources Journal* 25: 563-588
- [4]Barakat, E., 2005, Conflicts over local water allocation and conflict management mechanisms in Egypt: Case study from North Delta command area,
- [5]Shatanawi, M., 2005, Water conflicts and conflict management mechanisms in Jordan. World Bank
- [6]Absar, S. M., 2013, The future of water resource management in the Muslim world. *Journal of Futures Studies*, 17(3): 1-20
- [7]Tabieh, M. A., Suliman, J., Al-Horani, A., 2010, Pricing mechanism as a tool for water policy using a linear programming model. *Australian Journal of Basic and Applied Sciences*, 4(8): 3159-3173
- [8]Khdier, K., 2003, Water demand management options in Islamic countries. Policies and strategic options for water management in the Islamic countries Symposium (RCUWM-Tehran), Iran.
- [9]Kitamura, K., 2012, Issues of cost recovery and irrigation management transfer for irrigation and drainage in Egypt. *JARQ* 46 (2), 145–150
- [10]Easter, K. W., Liu, Y., 2005, Cost recovery and water pricing for irrigation and drainage projects. *Agriculture and rural development discussion*, Paper 26. World Bank.
- [11]Mergos, G. J., 1997, Sustainability, cost recovery and pricing for water in irrigation investment. *Options Méditerranéennes, Sér. A / n°31, Séminaires Méditerranéens* World Bank
- [12]MWRI, 2000, towards crop-based water charges. NWRP Project, Tec. Rep. No. 11, Cairo, Egypt.
- [13]Garrido, R., 2005, Price setting for water uses charges in Brazil. *International Journal of Water Resources Development*, 21(1), 99–117
- [14]Attia, B., 2007, Cost recovery in the irrigation and drainage sector: User’s Participation as a mechanism for its promotion. World Bank, agriculture and rural development discussion, Paper 33. Pp: 60-76
- [15]IDRC, 2005, Research results from the Minia Water Users’ Associations Project.” Minia University, Cairo, Egypt
- [16]AbuZeid, K., Abdel-Meguid, A., 2007, Water conflicts and conflict management mechanisms in the Middle East and North Africa Region, Center for Environment and Development for the Arab Region and Europe (CEDARE)

[17]IIMI, 1995, Irrigation service cost recovery in Egypt: Report on a workshop in cooperation with Ministry of Public Works and Irrigation, and USAID, Cairo

[18]Perry, C. J., 1995, Alternative Approaches to Cost Sharing for Water Service to Agriculture in Egypt. Research report 2, International Irrigation Management Institute, Colombo, Sri Lanka

[19] Bos, M. G., Walters, W., 1990, Water charges and irrigation efficiencies. Irrigation and Drainage Systems, 4, 267–278

COMPARATIVE ANALYSIS OF THE ORGANIZATIONAL MODELS IN ORGANIC FARMING

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Abstract

As regards to organic farming, organic farms have a lot of shortcomings in ensuring smooth organization of production due to climatic factors or crop sensitivity and action of pests and diseases, but especially to the high cost of inputs, reduced subsidies and difficulties in obtaining fair prices on the market. Understanding how the organizational structure of the business can compete to ensure efficiency at farm level is an important means to resolve these deficiencies. In this context, this paper aims to identify the characteristics of the organization of organic crop farms starting from an interview-based analysis of two large crop specialised farms in Tulcea and Calarași Counties. The information obtained through this method of investigation has been translated into a SWOT analysis and represented the basis for comparison with information gathered from other interviews from two organic farms in Scotland. The main conclusions we reached highlight two types of organization systems, one without integration and another with supply chain integration, very similar to the Scottish ones, but also showing a very obvious difference in the mentality of the farm owners; Romanians focusing on meeting the conditions for certification and maintenance of crops in organic, and the Scots at finding new markets.

Key words: differences, organizational models, SWOT analysis, similarities,

INTRODUCTION

The Romanian organic agricultural sector comprised in 2012 a number of 15544 operators, from which over 98% were agricultural producers. The main cultures cultivated in our country, on a surface of 288,3 thou ha, were grains (36%), grassland and forage (41%), oil and protein plants (18%), fruit and vines (2%), vegetables (1%) and other crops on arable land (2%) [6]. The main organic products provided to the market were: fresh fruit and vegetables, bread, pasta, pastry and confectionery, flour and cereal flakes, sunflower and soy oil, wine from organic grapes, honey, cow and sheep milk (cheese, butter, cream cheese), pork and beef (sausages, bacon, drums, pate, liverwurst, etc.), etc. [3].

Romanian organic producers are in majority small farmers, with an utilised agricultural area of 3-20 ha, with 3-5 milk cows, 50-100 sheep or have around 10 beehives [11]. There is a limited number of bigger farms, but they

demonstrated to have the capacity to resist on the market in the last years, more than all these small producers [1]. For this reason our purpose is to identify patterns in their way of organization, which can be used and implemented in other farms.

MATERIALS AND METHODS

The research of organizational models pattern for organic farms was based on an interview investigation method, which permitted us to obtain, through questions and answers, a clear and complete description of the organization of activities in organic farms. The interview is a conversation between two persons which have the main purpose, that to encourage “the production of a speech on a topic defined by a research setting” [2]. This instrument is an investigation technique utilized for the scientific and interdisciplinary knowledge of a particular phenomenon, and the data collection technique implies a favourable framework to obtain true information and

appropriate to the research objectives [8]. Also the interview-based survey is a “privileged instrument of fact exploration” [4].

The individual qualitative (non-structured) interview, which we decided to use, needs an extensive discussion between two parties, during which the questions are discovered and developed [7], the persons involved express themselves more creatively [5] and the flexibility of questions depends on the experience of the researcher [7]. The nondirective and non-structured interviews conducted were based on an interview guide shaped around six discussion themes: the transition process to organic agriculture and the problems encountered; management subsystem; production subsystem; supply-delivery subsystem; human resources subsystem; financial subsystem. The information obtained was structured on these themes and we extracted specific and meaningful elements for interpretation.

Starting from the responses obtained, we delimited the qualitative and quantitative disparities and we united them in a coherent form which characterizes structure and functionality of the organization models of organic crop farms. All the information was utilized for the completion of a SWOT analysis and also for comparison with other similar European farms.

RESULTS AND DISCUSSIONS

The organization models for Romanian organic crop sector were analyzed based on two interviews within a 420 ha farm (Farm A) and a 750 ha farm (Farm B).

The main organizational characteristics of Farm A – integrated in a chain of acquisition and distribution through association (S.C. ADAFLOR S.R.L.-Tulcea County)

Management subsystem: production is ensured but compensation for disasters is very low, organic crops are not protected from pollution by other economic entities; all measures must be taken to protect the

production from contamination affecting its quality.

Production subsystem: organic crops are more susceptible to pests than conventional ones; organic crops require irrigation systems, due to high sensitivity to the evolution of climatic factors, average productivity is similar to that of the conventional system, only by properly used organic fertilizer, especially respecting the climatic conditions; crop rotation is very important for achieving high yields; the technology is very important for maintaining soil quality; rejected production must be capitalized in the conventional system, inclusively for feed, which causes loss.

Supply-delivery subsystem: purchasing inputs at pool level for all group members is done with unanimous acceptance, through firm annual contracts, with a negotiable price; organic crops require identifying viable sources of organic fertilizers in local livestock holdings, which in time may become customers to providing rejected production; the inputs must be selected from the domestic and foreign markets; according to transport costs and prices, it is more cost effective for the seed to be provided internally – the holding, together with other members of the association create some seed required for all those in the group, for half the price on the market; production transport is handled by ship, but it must ensure the amount needed to fill it; the association provides storage, where each group member has their own space to avoid contamination and risks be managed; prior to shipping, samples are chosen from each container and sent to be analyzed in Bucharest, Constanța or in other countries; the distribution network is managed by the association, which production capitalization for all members, this resulting into a stable production; distribution channels are direct, all production goes to export (Germany, France, Austria, Switzerland, etc.); for the distribution management they generally work with the same clients, and to ensure they are kept, all of the preservation conditions necessary are insured for quality of production.

Human resources subsystem: problems finding employment, taking into account the technological needs of crops, very large number of labourers which involves high costs.

Financial subsystem: the conversion process involved an increase in costs on human resources, more manual work being needed for the technological process; profitability is average; costs are higher than in the conventional system due to manual work; organic farming as an activity is very expensive; organic fertilizers are more expensive than those used in conventional systems; treatments are highly priced and are needed to support the production; tests on samples are very expensive, this incurring on the cost of the farm; irrigation costs in areas affected by drought are very high; organic crop farming depends on subsidies, which are insufficient.

SWOT Analysis Farm A

Strengths: productivity per hectare is similar to that of conventional, with help from irrigation, organic fertilizers and other inputs used, it has the necessary equipment to smoothly carry out production technologies; has an irrigation system; by creating seed lots on farm it establishes its independence from suppliers and halves the cost of seed; purchase of inputs at pool level allows negotiation of prices and thus obtaining a lower level for these; inputs are purchased from domestic and foreign suppliers for all members of the association; the farm has a nearby organic livestock unit that represents the main source for organic fertilizer; storage facilities are provided by the association, each member being provided with different cells, so that not all production would be affected in case of contamination; test samples are taken from each cell, the acceptance of production for sale does not depend on the production of other members of the association; joint production sale allows negotiation of prices and thus achieving a higher price level; the market is provided by the association, which finds customers, bringing them to visit the crops and facilitating the sale; the whole production goes to export, production delivery

to all its members, is done in large quantities by ship, the cheapest form of transportation.

Weaknesses: yields per hectare are lower than those of the conventional farming; organic crops are more susceptible to pests; high consumption of water for irrigation due to climatic conditions, but also to technological needs; the cost of processing test samples is supported by the farmer (except tests that customers make on their own); the price of organic fertilizers and treatments used are higher than in the conventional system, the necessity for human resources is higher due to manual work that must be performed, which raises the cost of labour; there are difficulties in finding labour work; the clients who provide inputs, also buy production with up to 10 % more than the market price and sell high priced inputs, resulting in the identification of new markets; production and price volatility makes it difficult to reinvest the profits into new investments; insufficient subsidies given to the sector, organic farming being more expensive than conventional one; the production is insured but the compensations granted are very small.

Opportunities: rejected production is used as fertilizer and feed for the livestock unit in the area; the association is building a facility for association members that will reduce costs and the risk of contamination; samples are taken from each cell of the silage, which eliminates the risk of rejecting the entire production; possibility of extending the activity by structural funds projects; permanent consulting from the association and its members, decisions being taken unanimously.

Risks: storage within leased silos raises the risk of contamination; Structural Funds projects are very difficult to access.

The main organizational characteristics of Farm B – integrated in a chain of acquisition and distribution outside association (S.C. AUGER PETRUS S.R.L.- Calarasi County)

Management subsystem: the farm certifies their production with a German firm that handles all tests; samples are sent by the farm to the client in Germany, who has his own

laboratory, who also handles the costs; production is not insured, all measures must be taken to protect production contamination affecting its quality; the holding is part of Bioterra Association in Cluj, but only benefits of consulting and exchanging experience; working directly with two other companies created with other family members, one of them providing corn seed.

Production subsystem: organic crops are more susceptible to damage than conventional ones; organic crops require irrigation systems, being very sensitive to the evolution of climatic factors; secondary production is used as fertilizer, though there are no requests from other farms; compliance with technologies involves a greater resistance of organic crops to climate change than conventional crops; the farm has its own storage unit composed of three pieces each with 3000 metric tons and a laboratory which allows the analysis of grain into and out of storage.

Supply-delivery subsystem: Delivery is made by the factory directly to the customer, who also provides transportation; packaging is done within the farm, as a control measure for maintaining production quality; wheat, corn and peas are delivered to an organic egg farm that collects the merchandise from the farm; regarding the delivery system within the farm, the production exits by lorries, considering that other means of transportation increases the risk of contamination, but the positive aspect is that the transportation is handled by the client.

Human resources subsystem: organic farming has a very high number of labourers and involves high costs.

Financial subsystem: profitability is low compared to conventional farming; costs are higher than in the conventional system due to manual work; inputs are not overly expensive compared to the conventional farming; subsidies are lower and there are penalties for crops exiting the organic system; costs are higher than in conventional farming; crop farming depends on subsidies, but that is insufficient and is not fair to large farms that actually produce for the market, farmers were not consulted in the drafting of the legislation;

legislation is changing and constrains decision making; rules imposed within the conversion and certification system are difficult to meet.

SWOT Analysis Farm B

Strengths: compliance with technologies involves a greater resistance of organic crops to climate change than conventional crops; secondary production is used as fertilizer; farm has the necessary equipment to smoothly carry out production technologies; it has an irrigation system; farm has its own storage silos; packaging is done on the farm, into the packaging supplied by the client; samples for analysis are collected by the client and the costs are supported by him; the means of transport belonging to the client who is also the payer are checked by the farm before charging the production; most of the production is exported, the rest being taken up by livestock farms as feed; sales are being undertaken at the farm gate for all clients.

Weaknesses: productivity per hectare is much lower than that of conventional farming; high consumption of water for irrigation, due to climatic conditions, and technological needs; the number of day labourers is huge and involves high costs; the farm does not produce its own seed; production is not insured; organic crops are more susceptible to damage than conventional ones; legal regulations on keeping crops in organic affected the effective exercise of the production; output and price volatility makes it difficult to reinvest in new investments; costs at farm level are much higher than conventionally; subsidies are insufficient.

Opportunities: collaborations with the other family farms allows obtaining inputs at lower prices (seed); rejected production is used as fertilizer or sold as conventional production; experience exchange with members of the producer association which the farm is part of.

Threats: failure to comply with the quality requirements specified in the contract, due to adverse climatic conditions, leading to the rejection of the entire production; the law is constantly changing and legislative regulations are not sufficiently explained to farmers, which can result in

penalties. Comparative analysis with Scottish organic farms

The information presented above collected from Romanian farms were further compared with those collected in two farms in Scotland (in a study visit at "The James Hutton Institute", in the town of Dundee): GREEN GROWERS LLP (Limited Liability Partnership) Farm - based in Turriff Aberdeenshire (specializing in crops); Mid Coul Farms Limited - located in Dalcross, Inverness (mixed profile).

Table 1. Comparative analysis of Romanian and Scottish model of organization

Similarities	Differences	
	Organic farming - Romania	Organic farming - Scotland
Crop Sector		
Organic crop farms: - did not have problems in conversion - lower yields in the first years of conversion - lower efficiency than in conventional farming - do not have processing or packaging units, the products are taken in raw form - There were no difficulty in obtaining organic certification [9][10] - costs are higher than in conventional farming	Organic crops were affected by pests. No special measures are taken in the field to avoid contamination by other crops. Organic crops are affected by climatic conditions in our country (drought). Low profitability compared to conventional. They had advisory services. Inputs are supplied by the customer or purchased from local producers, or importers. Subsidies are insufficient. There are investments in the technical infrastructure. Risks coming from weather and unfulfillment of contracts. The land is used exclusively for production. Organic crop farming is considered inefficient due to high costs. Distribution is	Organic crops were not affected by pests. Few problems with pests and diseases, but weeds are an issue. They create buffer strips of about 6 m or live hedges to limit other crops, and also cover the crops. Organic crops do not face droughts, but face excess moisture. Adequate profitability. No advisory services taken. Farmers have a list of accredited providers and select them according to price. The subsidies are higher than in conventional farming. No recent purchases made (farms have an age much greater than 10 years). High risk due to market fluctuations and the possibility of not finding a buyer. Part of the land is rented out to livestock farms (sheep and Broiler chickens for organic fertilizer) Organic farming is considered inefficient because prices in recent years have been declining and they forced the reduction of organically cultivated land. Distribution is via transportation to the customer, through intermediaries or

Similarities	Differences	
	Organic farming - Romania	Organic farming - Scotland
	done either at the farm gate or by transport to the client.	directly in stores and supermarkets. Companies that sell in supermarkets own / collaborate with packaging / processing companies and invest in advertising (through affiliation with advertising agencies that promote organic crops).

Source: own creation

Based on these interviews we further detected similarities and differences between the organization of Romanian and Scottish farming which we have implemented in the table above.

CONCLUSIONS

Following interviews we identified following organizational features:

-S.C. ADAFLOR S.R.L. is a farm of 420 ha, specialized in growing crops - organic crops are located in an area prone to drought, with high consumption of water for irrigation, productivity per hectare is similar to that of conventional farming in terms of good agricultural years; the area has years of insect infestation; the workforce is difficult to identify in the area; the number of day labourers is very high due to manual work; the prices for the main inputs (fertilizers and treatments) are higher than in conventional farming; cost for crop testing is supported by the farm; the profit is not used for investment; compensations in case of damage are very small; rejected production is used as fertilizer or sold to livestock farms, etc.

-S.C. AUGER PETRUȘ S.R.L. is a farm of 750 ha, specialised in growing crops - organic crops are located in an area prone to drought; productivity per hectare is lower than that of conventional farming; the number of day labourers is very high due to manual work; input prices are higher compared to the conventional farming but not very much; the cost of processing crop testing is supported by the client; production and price volatility makes it difficult to reinvest profits in new investment; production is not insured; the rejected production is used as fertilizer or sold at conventional price, etc.

The comparison with Scottish farms revealed the following:

- **similarities:** organic crop farms do not have encountered problems in conversion or certification processes; had lower yields in the first years of conversion and still lower than conventional yields; no processing or packaging units; costs are higher than in conventional farming;

- **differences:**

- **Romanian farms:** prone to losses due to climatic conditions; lower profitability than in conventional farming; inputs supplied by the client or purchased from local importers or producers; subsidies are insufficient; land is used exclusively for production; crop farming is deemed inefficient due to high costs;

- **Scottish farms:** fewer problems with pests and diseases; adequate profitability; there is a list of accredited providers, selected based on price; subsidies are higher than in the conventional farming; part of the land is rented out to livestock farms; organic farming is considered inefficient because prices in recent years have been declining and forced reduction of organically cultivated land.

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REFERENCES

[1] Bălan, A., Toma, E., 2012, Organic crops' economic efficiency based on a case study from the Călărași county.crops, 2008 – 2009, Scientific Papers Series "Management, Economic Engineering in Agriculture and Rural Development", 12 (4)

[2] Blanchet, A., 1985, L'entretien dans les sciences sociales. L'écoute, la parole et les sens, Paris : Dunod.

[3] Cofas, E., 2012, National agricultural policy for organic farming in Sustainable Rural Development. International Scientific Symposium, Timișoara, Agroprint, 14 (1):151-156

[4] De Singly F., Blanchet A., Gotman A., Kaufmann, 1998, Ancheta și metodele ei: chestionarul, interviul de producere a datelor, interviul comprehensiv (The survey and its methods: questionnaire, interview data production, comprehensive interview), Ed. Polirom, Iași, ISBN 973-683-141-8, pg. 123, 87-98

[5] Douglas J., 1985, Creative interviewing, Ed. C.A.Sage

[6] Grosulescu I., 2012, Agricultura ecologică în România (Organic farming in Romania), Ministry of Agriculture and Rural Development, General Directorate of Agricultural Policies and Strategies

[7] Iluț P., 1997, Abordarea calitativă a socio-umanului (The qualitative approach to social and human), Ed. Polirom, ISBN 973-683-028-4, pg 87-98

[8] Miftode V., 1995, Metodologia sociologică – metode și tehnici de cercetare sociologică (Sociological Methodology - Methods and techniques of sociological research), Ed. Porto-Franco, Galați, ISBN 973-557-396-2, pg 225-240

[9] Muscănescu A., 2013, Analysis of the process of organic certification in The United Kingdom, Scientific Papers Series "Management, Economic Engineering in Agriculture and rural development", 13 (2):279-282

[10] Muscănescu A., 2013, Dynamics of organic agriculture in The UNITED KINGDOM, Scientific Papers. Series "Management, Economic Engineering in Agriculture and rural development", 13(2):273-278

[11]*** Cioceanu M., 2012, Articol intitulat "Agricultura ecologică din România și-a triplat numărul operatorilor din sistem, în 2011" Article entitled (Organic farming in Romania has tripled the number of operators in the system in 2011), <http://www.romanalibera.ro/bani-afaceri/economie/agricultura-ecologica-din-romania-si-a-triplat-numarul-operatorilor-din-sistem-in-2011-248703.html>

ECONOMIC EFFICIENCY ANALYSIS OF ORGANIC CROP AND ANIMAL FARMS IN ROMANIA. COMPARATIVE EVOLUTIONS

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Abstract

The organic sector in our country, although as shown in continuous development, faces a multitude of problems: the climatic conditions of our country, characterized by periods of drought in many parts of the country, high input prices, the majority of which are imported; difficulties in identifying markets for products, reduced subsidies, standardized conditions difficult to meet, etc. The problems the sector is facing reflect in the organization of the production activity and hence the economic performance of farm production. Accordingly, the aim of this paper was to analyze on the basis of annual financial and accounting information collected in the two vegetable farms and the two animal breeding farms, their efficiency / inefficiency, and the results were compared to identify the causes of the differences obtained in the efficiency at a farm level. The results obtained reveal a higher level of return on integrated vegetable farm in a joint recovery and a high efficiency for chain integrated animal farms.

Key words: efficiency, organic crop production, organic livestock, return rates

INTRODUCTION

Many research studies regarding the organic and conventional agriculture concluded from an economic point of view that the organic farming, due to balanced crop rotation and the utilization of organic inputs, can be more efficient [4]. Actually there are many studies in this area that point out the economical differences of organic agriculture versus conventional agriculture like the following: the energy costs are lower [1]; the manual work costs rise the total cost with 20-30% [5]; the energy efficiency is higher for organic crops [6]; the lower yields need to be compensated by adequate technologies and management decisions to insure profitability [3]; etc.

In Romanian agriculture, conventional and organic farmers' efficiency is affected by many factors: the fragmentation of agricultural land and small physical dimension; outdated technology and reduced competitiveness; lack of working capital for farmers; difficulties of access to bank loans. etc. [2]. Regarding the efficiency of organic farms compared with conventional farms, this

is often a much disputed subject. Due to the low yield per hectare and in many cases to higher prices of inputs, organic agriculture is often considered to be inefficient. In this context, our main purpose was to identify organic farms that can insure economic efficiency, and to point out their main characteristic and the condition in which these farms succeed to resist on the market.

MATERIALS AND METHODS

The research regarding organic farming efficiency was conducted on four organic farms: Farm A – vegetal profile - average surface of 420 ha (Tulcea County); Farm B - vegetal profile – average surface of 750 ha (Călărași County); Farm C – animal breeding profile – average livestock of 50 (Suceava County); Farm D - animal breeding profile – average livestock of 60 (Suceava County). At these farms' level we accomplish an economical-financial analysis based on annual financial statements from 2008-2012 periods concentrating on the main financial indicators and the main efficiency indicators [7]. We will concentrate in this paper on the efficiency

indicators, respectively: the efficient utilization of resources (assets, human resources, receivables, etc.) by reporting the indicators to 1000 RON turnover; commercial, economic and financial rates of return.

RESULTS AND DISCUSSIONS

The main organizational characteristics of vegetal farms in 2008-2012 periods:

Farm A - organic crops are located in a droughty area; has an irrigation system; productivity per hectare is similar to that of conventional agriculture; the inputs are purchased through the association; the production is sold through the association; the distribution and transport it's done by ships (Danube River).

Farm B - organic crops are located in a droughty area; has an irrigation system; productivity per hectare is lower than that of conventional agriculture; the inputs are obtained from local distributors; the production is stored in their own silage compound; the production it's sold at the farm gate.

The main economic characteristics of vegetal farms in 2008-2012 periods:

Farm A - specialized in crop production, in 2012 had a turnover of 1.4 million RON, with 20.3% lower, compared to 2008 [8]. The farm ensures its revenue in proportion of 62.6% from the sale of production and in proportion of 26.8 % from subsidies. Of the total costs, 35.6% are raw material costs and 20.7% are external services expenses 20.7%. With regard to economic and financial efficiency, the analysis revealed the following: the farm was profitable (operational and financial results are positive); the degree of material resources use has been declining; the farm ensures the efficiency of fixed assets, receivables, human resources and total costs; the farm didn't ensure the efficiency of external services expenses; the commercial, economic and financial return rates were growing.

Farm B - specialized in crop production, in 2012 had a turnover of 2.4 million RON,

lower with 31.9% compared to 2008 [9]. The farm ensures its revenue in proportion of 54.5% from the sale of production and in proportion of 32.7 % of commodity sales. Of the total costs, only 18.5% are raw material costs, only 16.4% are external services expenses and 29.7% are commodity expenses. With regard to economic and financial efficiency, the analysis revealed the following: the farm was less profitable and its profitability was declining; the degree of use of material resources has been increasing; the farm didn't ensure the efficiency of fixed assets, receivables, human resources and total costs; the farm ensures in a small measure the efficiency of raw materials and external service expenses; the commercial, economic and financial return rates were decreasing even though the farm was very active on the market.

The comparative economic and efficiency indicators evolution on crop farms (Table 1).

Table 1: Comparative analysis of economic and financial statement of organic crop farms

	Farm A	Farm B	Observations
Revenue			
The share of revenue from the sale production in the turnover	91,8%	62,5%	Farm B completes its revenues by selling organic inputs to other producers. Farm A kept the level of sales of goods in the period 2008-2012 almost constant.
The share of revenue from the sale production in total revenue	62,6%	54,5%	
Share of subsidies in total revenue	26,8%	4,4%	The share of subsidies in total revenue is lower for Farm B. This is the main reason of dissatisfaction of the proprietor.
Costs			
Raw materials and supplies costs	35,6%	18,5%	Farm A purchases inputs by association from customers or external suppliers, ensuring higher productivity. Farm B, provides its inputs from local suppliers and within own farm. (we consider that the difference is of about 3000 lei/ha between the two companies regarding this category of expenditure).

	Farm A	Farm B	Observations
Costs with external services	20,7%	16,4%	Farm B, due to larger surface obtains greater efficiency in relation with third parties (especially for mechanical work). As a share these expenses are lower in total expenditure.
Energy and water costs	3,2%	3,9%	Farm B, located in the south of Romania, consumes more for irrigation, these expenses having a higher share.
Personnel costs	8,7%	5,3%	Farm A, employs more laborers annually, although it has a smaller area, which increases the amount of the expenses in total costs.
Profit			
Net profit	420145	-197505	Farm B had loss in 2012, due to high costs for goods and low productivity. Farm A has a greater stability of profit, which is higher than that achieved by Farm B, even though the cultivated area is smaller. This is due to the stability provided by the association and results in higher productivity per hectare.
Effectiveness of work (SIG)			
Trading margin	+	+	Farm B, as mentioned before, had difficulty in valuing goods, but managed to maintain a positive trade margin.
Year production	+	+	Both companies fail to provide more value than the value of goods and services from third parties, and a very high production year, however EBE is negative, which indicates that the companies did not obtain availabilities from operating activities. However, the inefficiency of costs use has made its mark on Farm B, which demonstrates an actual financial inability for funding future work.
Value added	+	+	
Gross operating surplus	-	-	
The result of the operation	+	-	
Year result (net profit)	+	-	
Self-financing capacity	+	-	
Evaluation of results and commercial performances			
Dynamics index - turnover (I_{CA})	$I_{CA} > I_{Qf}$	$I_{CA} < I_{Qf}$	Farm A has a tendency for stock formation but in decrease just as Farm B, but Farm B manages to make better production.
Dynamics index - commodity production (I_{Qf})			
Dynamics index - commodity production (I_{Qp})	$I_{Qe} > I_{Qf}$	$I_{Qe} > I_{Qf}$	Both companies have blocked the assets under form of stocks, and also an increase in domestic consumption.
Dynamics index - year production (I_{Qe})			

	Farm A	Farm B	Observations
I_{CA}/I_{Qf}	<1	<1	Delivery rate is lower than the rate of production, but faster for Farm B.
I_{Qf}/I_{Qe}	<1	<1	Production completion rate is lower than the rate of total volume of activity, but faster from Farm A.
Resource utilization assessment during 2008-2012			
Profit from 1000 Lei fixed assets	↑	↓	Farm A: efficiency Farm B: inefficiency
Stock rotation speed	↓	↑	Farm A: inefficiency Farm B: efficiency
Average time for recovery of claims	↑	↓	Farm A: inefficiency Farm B: efficiency
Work productivity	↑	↓	Farm A: efficiency Farm B: inefficiency
Total costs for 1000 Lei from operating revenue	↓	↑	Farm A: efficiency Farm B: inefficiency
Costs with raw materials and consumables for 1000 Lei in operating revenue	↓	↓	Farm A: efficiency Farm B: efficiency
External services costs for 1000 Lei in operating revenue	↑	↓	Farm A: inefficiency Farm B: efficiency
Evolution of return rates during 2008-2012			
Trade margin rate	↓	↓	As appreciated by the heads of farms, commercial, economic and financial profitability has decreased in the analysis period. Only Farm A managed to ensure a surplus reported profit and equity in net assets. This proves the inefficiency of the operating activity in relation to turnover, assets in which were invested and capital used.
Gross operating margin rate	↓	↓	
Net operating margin rate	↑	↓	
Margin rate on value added	↓	↓	
Economic profitability rate	↑	↓	
Gross margin rate of accumulation	↓	↓	
Rotation coefficient of capital	↓	↓	
Gross economic active return	↓	↓	
Net financial return	↑	↓	
Financial return before tax	↑	↓	
Profit rate	2,8% - 2008 27,4% - 2012	11,6% - 2008 6,7% - 2012	

Source: own evaluation based on annual financial statements

The main organizational characteristics of animal breeding farms in 2008-2012 periods:

Farm C – land cultivated with forage; productivity is similar to that of conventional agriculture; human resources requirements are

small (one employee and day workers); production is stored in their own cooling tanks; the production is sold at farm gate to the milk factory (LaDorna).

workers and family members); production is stored in their own cooling tanks; the production is sold at farm gate to the milk factory (LaDorna) and 1% is kept for family consumption.

The main economic characteristics of animal breeding farms in 2008-2012 periods:

Farm C - specialized in milk production, had in 2012 a turnover of 1.5 million RON, higher with 37.9% compared to 2008 [10]. The farm ensures its revenue in proportion of 84.9% from the sale of production and in proportion of 15.1 % from subsidies. The main expenses were with raw materials (75.4%), human resources (10.1%) and with external services (6.3%). The farm was profitable in the analyzed period, except for 2011, and ensured a high degree of use of all material resources. Also the farm ensured the efficient use of fixed assets, stocks, receivables, human resources and costs. Also, its commercial, economic and financial return rates were increasing.

Farm D - specialized in milk production, had in 2012 a turnover of 0.44 million RON, lower in the entire period with 40-50% compared to 2008 [11]. The farm ensures its revenue in proportion of 95.2% from the sale of production and in proportion of 4.8% from subsidies. The main expenses were with raw materials (24.1%), human resources (29.4%) and with external services (21.9%). The farm was slightly profitable in the analyzed period, ensuring the use of material resources until 2011. The farm didn't ensure the efficient use of fixed assets, stocks, receivables, human resources and raw material costs. Also the commercial, economic and financial return rates were low.

The comparative economic and efficiency indicators evolution on animal breeding farms (Table 2)

Farm D – land cultivated with forage; productivity is lower to that of conventional agriculture; human resources requirements are higher (four employees, a veterinarian, day

Table 2: Comparative analysis of economic and financial statement of organic animal breeding farms

	Farm C	Farm D	Observations
Revenue			
The share of revenue from the sale production in the turnover	87,5%	98,7%	The companies leverage almost the entire production to the LaDorna milk factory.
The share of revenue from the sale production in total revenue	84,9%	95,2%	
Share of subsidies in total revenue	14,1%	1,24%	Subsidies share is higher for Farm C, it having fewer livestock.
Costs			
Raw materials and supplies costs	75,4%	24,1%	Farm C acquires the majority of inputs, organic feed being bought from a supplier located 100 km away. Farm D has greater capacity to insure fodder, owning more organically certified land.
Costs with external services	6,3%	21,9%	Farm D has a higher share of costs to third parties, owning more land that requires technological works.
Energy and water costs	1,02%	0	This type of costs have a low share in total.
Personnel costs	10,1%	29,4%	Farm D has more employees and laborers annually (4 permanent employees, 1 veterinarian, about 20 laborers).
Profit			
Net profit	184140	812	Farm C operates with only one employee and family members, obtaining a higher productivity per animal, ensuring its high profitability, especially with subsidies.
Effectiveness of work (SIG)			
Trading margin	+	0	Sales of goods is an ancillary activity, with little importance to ensure farm income.
Year production	+	+	Both livestock farms fail to add value to the over consumption of third
Value added	+	+	
Gross operating surplus	+	+	

	Farm C	Farm D	Observations
The result of the operation	+	+	parties, as well as high production year. Positive EBE reveals that the farms have availability from operating activities, especially since the factory's daily delivery and fast payment.
Year result (net profit)	+	+	
Self-financing capacity	+	+	
Evaluation of results and commercial performances			
Dynamics index - turnover (I_{CA})	$I_{CA} > I_{Qf}$	$I_{CA} < I_{Qf}$	Farm C shows an increase in inventories, unlike Farm D who succeeds to make better production.
Dynamics index - commodity production (I_{Qf})			
Dynamics index - commodity production (I_{Qf})	$I_{Qe} < I_{Qf}$	$I_{Qe} > I_{Qf}$	Farm C shows a reduction in the consumption share of third parties. Farm D show blocked assets under the form of stocks, but also an increase in domestic consumption.
Dynamics index - year production (I_{Qe})			
I_{CA} / I_{Qf}	>1	<1	For Farm D the delivery rate is lower than the production rate and this reversed for Farm C.
I_{Qf} / I_{Qe}	>1	<1	For Farm D the production completion rate is lower than the rate of the total volume of activity and this is reversed for Farm C.
Resource utilization assessment during 2008-2012			
Profit from 1000 Lei fixed assets	↑	↓	Farm C: efficiency Farm D: inefficiency
Stock rotation speed	↓	↑	Farm C: inefficiency Farm D: efficiency
Average time for recovery of claims	↑	↓	Farm C: efficiency Farm D: inefficiency
Work productivity	↑	↑	Farm C: efficiency Farm D: efficiency
Total costs for 1000 Lei from operating revenue	↓	↓	Farm C: efficiency Farm D: efficiency
Costs with raw materials and consumables for 1000 Lei in operating revenue	↓	↑	Farm C: efficiency Farm D: inefficiency
External services costs for 1000 Lei in operating revenue	↓	↑	Farm C: efficiency Farm D: inefficiency
Evolution of return rates during 2008-2012			
Trade margin rate	-	↓	As the manager of Farm C had stated, the commercial, economic and financial return is good. The farm had the advantage of
Gross operating margin rate	↑	↑	
Net operating margin rate	↑	↑	
Margin rate on value added	↑	↓	

	Farm C	Farm D	Observations
Economic profitability rate	↑	↓	winning a Measure 112 Project which allowed it to invest no additional cost. Farm D though shows a decrease in market activity, as well as a lower economic and financial return. This is due to the investments made in recent years in construction and animals, the farm having a policy of expansion.
Gross margin rate of accumulation	↑	↑	
Rotation coefficient of capital	↑	↓	
Gross economic active return	↑	↑	
Net financial return	↑	↓	
Financial return before tax	↑	↓	
Profit rate	0,4% - 2009 13,6% - 2012	1,9% - 2008 4,0% - 2012	

Source: own evaluation based on annual financial statements

CONCLUSIONS

The comparative analysis of the efficiency of large organic crop farms, taken into study, shows that the overall work is cost effective for the farm integrated into the associative system, while the company operating by itself on the market managed to stay profitable only in the agricultural years with favorable climatic conditions.

The economic crisis, lack of productivity, problems in selling goods, increased costs, reduced subsidies, etc. adversely affected Farm B (750 ha), there were years when the profit rate fell below 1%. Farm B (420 HA) without getting a great return in the period analyzed, thanks to distribution through the association of the inputs used and the productivity achieved, managed to get a rising rate of profit that came to 27.4% in 2012. The company's strategy to invest in quality inputs, more labor (which reduces work time), seed production, etc. gives better stability on the market.

Farm C (20 cows and 20 young cattle) has been very profitable in the period under review, with an increasing profit rate (13.6% in 2012). The company invested through Structural Funds, but having a lack in overall technical infrastructure for livestock. Increased investment and business

expansion in the absence of structural funds financing affected the results obtained by Farm D (57 cows), with an economic and financial return and a lower profit rate of up to 4%.

The integration of these two farms in the LaDorna Factory structure of milk collection, plus subsidies for being located in a disadvantaged area and access to green fodder base, leads us to say that the two farms fail to remain active on the milk market in the analyzed area.

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REFERENCES

- [1] Bălan, A., Toma, E., 2012, Organic crops' economic efficiency based on a case study from the Călărași county crops 2008 – 2009, Scientific Papers Series "Management, Economic Engineering in Agriculture and Rural Development", USAMV Bucharest, 12 (4): 9-12
- [2] Cofas, E., 2012, National agricultural policy for organic farming, Sustainable Rural Development. International Scientific Symposium, Timișoara, Romania, 25 May 2012, AgriPrint, 14 (1): 151-156
- [3] De Ponti, T., Rijk, B., Van Ittersum, M. K., 2012, The crop yield gap between organic and conventional agriculture. *Agricultural Systems*, 108:1-9
- [4] Grigore, A.A., Abargaoniei, S.V., Nancu, D.V., Ghiculescu, R., 2008, Analiza comparativă privind eficiența economică a produselor agricole convenționale și a celor ecologice, *Lucrări Științifice Seria Agronomie*, 51(3):333-338
- [5] Morna, A., 2010, Organic farming-past, present and future, *Lucrări Științifice, Universitatea de Științe Agricole și Medicină Veterinară a Banatului, Timișoara, Seria I, Management Agricol*, 12(2)
- [6] Seufert, V., Ramankutty, N., Foley, J. A., 2012, Comparing the yields of organic and conventional agriculture. *Nature*, 485(7397): 229-232
- [7] Vintilă Georgeta, 2000, Gestiunea financiară a întreprinderii (Financial management of the enterprise), Editura Didactică și Pedagogică, București
- [8] *** Annual financial statements – S.C. ADAFLOR S.R.L.
- [9] *** Annual financial statements – S.C. AUGER PETRUȘ S.R.L.
- [10] *** Annual financial statements – S.C. DANY LILY S.R.L.

[11] *** Annual financial statements – S.C. BEST COWS S.R.L.

WASTE MANAGEMENT GENERATED FROM AGRICULTURE IN CĂLĂRAȘI COUNTY

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Abstract

The agriculture practiced in Calarasi county has negative effects on soil and water sources. The significant quantities of chemical fertilizers and fito-sanitary products, mono crops practicing, vegetal layer reducing (pasture) and poor organic waste management derived from agriculture (vegetal remains and animal manure) lead to soil and ground water pollution. Due to the geographical position of the county, it is needed to monitor constantly the agricultural sector that can flow into the Danube high quantities of nitrites and nitrates. Călărași county has a high potential of biomass, enough to obtain natural fertilizers and biogas.

Key words: biogas, bio waste, chemical fertilizers, compost, phyto-sanitary products

INTRODUCTION

The sustainable development and integrated waste management methods assume a stable ratio between the natural habitat and people in the respective area.

The main objective of this paper is to present options for the sustainable management of organic waste from agriculture to maintain a balance between the natural environment, its resources and man. Farmers and the others living in the rural areas should be aware of the negative impact of incorrect waste management, which subsequently reflects upon them and future generations.

Călărași county is well known for agricultural profile, mostly cereals. The agricultural waste management is needed to maintain soil fertility through the application of methods for recovery of the resulted biomass - namely through methods such as composting and methanisation, which will have an impact on human health and on environment protection. Soil pollution leads to affect its fertility, disturbing all its physicochemical, biological and biochemical functions [5].

The concept of sustainable development involves the application of biowaste recycling methods to replace conventional farming. Soil conservation in its lively form is the only guarantee of the future of every nation and of the planet as a whole [2].

MATERIALS AND METHODS

As any economic activity, agriculture also generates waste but they have a special character, requiring attention. Farmers carry out their current activities to ensure a considerable profit, but it must be combined with monitoring the entire production chain from the farm, including proper management of manure and vegetal residues [3].

The main sources of data in the paper are provided by the Environmental Protection Agency and the Department of Agriculture in Calarasi, units that monitor waste management unit and agricultural activity in the county.

The base of agriculture in Calarasi county is represented by agricultural land, that has about 425.000 hectares. The percent of person in the rural area that develops activities in agriculture in the county is of 70%. Călărași is

situated in the top of the counties in Romania from the point of view of the production of wheat, barley and sun flower.

The practice of monoculture and the application of large amounts of chemical fertilizers to enhance production in this area have led to the degradation of the environment, particularly soil and groundwater.

The actual pollution of soil and groundwater can be reached when harmful substances that reach the soil exceed that soil capacity to degrade these substances [1].

The four main sources of water pollution by nitrates are nitrates from manure and household waste mineralization, those from the fermentation without a guide or mismanaged waste and waste water from livestock, nitrates from fertilizers and those coming from mineralization of humus [4].

RESULTS AND DISCUSSIONS

As regards the distribution of agricultural lands in the county, the highest surface is occupied by arable land - 96,64 %, due to the geographical area of plain.

On types of use, during the last three years, the distribution and evolution of agricultural lands is as follows:

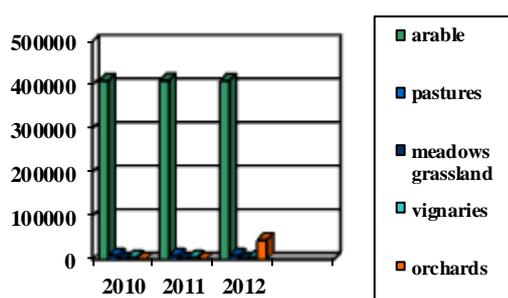


Fig. 1. Situation of agricultural land on categories of use in Calarasi county in the period 2010-2012 (in hectares)

The evolution of agricultural land distribution shows that areas in the last three years are relatively constant in all categories, except in 2012 the grassland area reached zero that contributes to the degradation of the soil quality (it is needed to keep in the plain are a surface to help the soil remineralization after intense use in conventional agriculture). From

the figure we can see that large amounts of vegetable waste from agricultural activities are produced.

The total cultivated surface, in 2012, was of 410,7 thousand hectares, the surfaces cultivated being very close to the previous year, 2011 – 409,7 thousand hectares [9].

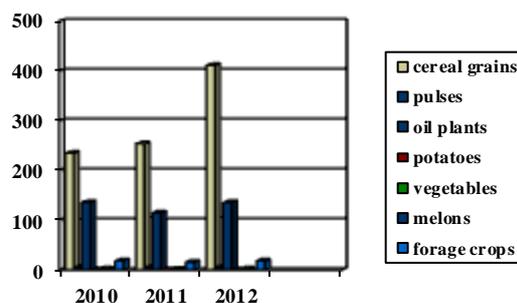


Fig.2. Surface cultivated with main crops in Calarasi county in the period 2010 – 2012 (in thousand hectares)

The most significant share of cereal grains culture is held by wheat and rye, followed by maize, and barley crops.

The areas planted with major crops recorded slight variations due to the weather conditions precipitations uniformly distributed, but they are generating the second production following processes after harvest: corn cobs, straw, stalks.

The intensive farming of cereals mainly has a negative impact on the soil, decreasing the reserves of nutrients. The solution could be growing grain vegetables as they have a positive effect on agricultural land, helping to restore the background of natural chemicals (it fixes nitrogen in the soil) [7].

According to the data provided by Calarasi County Agricultural Department [8], the dynamics of livestock in the same period was the following:

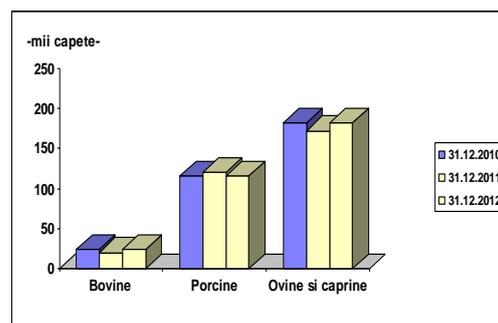


Fig.3. Evolution of livestock in Calarasi county in the period 2010 – 2012 (thousand heads)

The figure above highlights the fact that in 2012 the number of cattle registered a small decrease, the other livestock presented registered a significant increase especially sheep and poultry. The quantities of manure generated require the application of technologies to meet the environmental requirements imposed by the current legislation.

The livestock sector is an important sector of the economy, particularly that of poultry placing the county on the first place in the sheep and poultry held.

The data in this graph show insignificant fluctuations made during the three years analyzed, but the fact that they are owned by the private sector it means a greater need to manage correctly not only the livestock but also the manure that results following their exploitation.

One of the worst effects of excessive use of chemical fertilizers is produced by the phenomenon of washing of nutrients and water from the soil by irrigation or rainfall and their infiltration into groundwater, contributing to increased rates of eutrophication of water [6].

Table 1. Evolution of use of chemical fertilizers in Calarasi county in the period 2010 – 2012

Year	Fertilizers used (tons of active substance)			
	Nitrogen	Phosphor	Potassium	Total
2010	14210	6002	912	21124
2011	14210	6170	1116	21496
2012	14210	6002	912	21124

The quantity of chemical fertilizers used in the three years analysed [10] is relatively constant, variations being very small. From the quantities used, we can understand why Călărași is among the polluted area with nitrates derived from the agricultural activity. For the plants protection, the fito-sanitary products used in the last years are mentioned in Table 1.

From Fig.4, one can see that the fito-sanitary products are present in quite high quantities, this being a consequence of using fertilizers

that attract different pests. The year 2012 totalize the highest quantity, comparatively to the previous years.

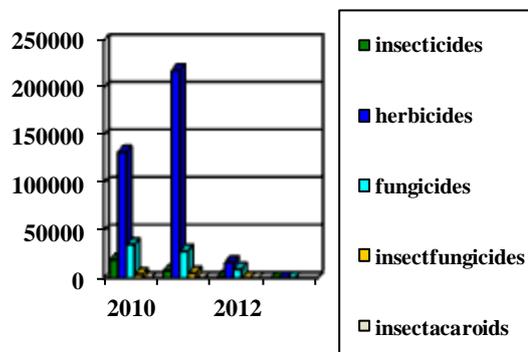


Fig. 4. Evolution of use of fito-sanitary products in agriculture in Calarasi county in 2010-2012 (tons of active substance)

CONCLUSIONS

In conclusion, the conventional agriculture is only an economic business in the rural areas that does not pay due attention to the environment, under the pretext that the population needs increasing amounts of food, which leads to a number of problems: compaction, erosion and pollution of soil and underground water contamination and eutrophication due to nitrates and phosphates; human health effects due to pesticide residues and additives in animal nutrition, landscape degradation

The vegetable and animal husbandry sector in the county have negative effects on soil and water sources, which are subject to deterioration and pollution.

The large quantities of fertilizers and plant protection products are used in conventional agriculture, degradate the natural resources and the main factor of production, soil, too heavily exploited.

The livestock sector produces manure with a high content of nutrients that can be converted into organic fertilizers. They are a source of groundwater pollution by nitrates, due to improper storage, due to ignorance or poor information.

Due to its geographical position which includes two important elements: Bărăganului Plain with fertile soil suitable for agriculture and the Danube Valley, it is necessary to

constantly monitor the agricultural sector, which can discharge large amounts of nitrates and nitrites in the Danube.

The eutrophication process is a serious negative consequences due to poor management of agricultural waste and poor representation of organic agriculture in the county.

Organic waste management in agriculture is not just about compliance with environmental standards, it encompasses benefits for those who practice agriculture, allowing them to diversify their activities and increase their profits. Through proper use of biomass, they can develop a strong market for organic products by composting technology and organic farm practicing.

Another benefit brought by crop residues and livestock manure is the renewable energy, biogas with its dual use electricity and heat, that allows the removal of the "label" given to agriculture of intensive energy consumer.

Calarasi county has a significant potential of agricultural biomass, due to the large area of farmland.

The application of alternative composting and methanisation represents the reduction/elimination of pollution from agricultural activities, if farmers will understand the new direction of agriculture and of the rural area represented by durability.

The advantages of biogas are that it is a renewable energy source that replaces successfully the sources depleting that have been overused.

In Calarasi county, the sustainable development of agriculture and the entire rural area must be applied, considering the agricultural area and the share of agriculture in GDP, the viable solutions being the ecologic agriculture to minimize soil degradation.

A solution to the problems identified is the construction of storage platforms and agricultural waste landfills. It is necessary passing to sustainable agriculture, building a compost market for the development of organic products that are sought in the European Union.

The correct use of agricultural land involves the cultivation of leguminous plants that fix nitrogen in the soil and increase the meadow, because under the natural vegetation, the soil fertility regenerates continuously, reaching a steady state of nutrients.

Also, the vegetal sector must be correlated with the livestock for the best use of its potential the county has. If the two sectors support mutually, the possibility to achieve increased profit is considerable (meat has a higher value compared to vegetal production). European funds accessing both in agriculture and environmental protection provides financial support for those who want to practice organic farming and conserve environmental resources.

REFERENCES

- [1] Berca M., 2006, Planning of environment and natural resources management, Ceres Press House, Bucharest, p.284
- [2] Berca M., 2008, Problems of soil ecology, Ceres Press House, Bucharest, p. 18
- [3] Barloy, J.,2008, Pollution des sols et des eaux par les engrais et les effluents d'élevage. Course. University of Agricultural Sciences Banat – Timișoara, p.33
- [4] Code of best agricultural practices, vol I, Bucuresti, 2003, 55.
- [5] Penescu, A., Băbeanu, Narcisa, Marin, D. I., 2001, Ecology and environment protection, Sylvi Press House, Bucharest, p.206.
- [6] Ghinea, L., 2002, Biology of microbiology of soil - course, Agroprint Press House, Timișoara, p.107;
- [7] Neagu, Cecilia, Doctoral Thesis, 2006, p.57
- [8] Annual Report on environment state in Călărași county in 2010, elaborated by APM Călărași; <http://www.apm.ro>
- [9] Annual Report on environment state in Călărași county in 2011, elaborated by APM Călărași; <http://www.apm.ro>
- [10] Annual Report on environment state in Călărași county in 2012, elaborated by APM Călărași; <http://www.apm.ro>

IMPACT OF CREDENCE ATTRIBUTES OF AGRICULTURAL FOOD PRODUCTS ON CUSTOMER ATTITUDE

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Abstract

The objective of this study is to enhance understanding on how a firm can generate value for its customers using a competitive advantage strategy by accumulating credible attributes to its products. There are certain product attributes that customers can only perceive. In the case of agricultural food products, the customers' consciousness for safe, natural and organic products has enriched the perceived value of the product. To explore the relationship between the credence attributes and attitude of the customers for the agricultural food, a survey questionnaire has been administered to consumers of agricultural food products in the different regions of Punjab, Pakistan. The data analysis has been conducted using the Statistical Package for Social Sciences (SPSS) to investigate the desired relationship in that particular region of the country. It can be concluded that the trust of customer is now very much depending on the presence of credence attribute that customer cannot describe but evaluate during the purchase of food items.

Key words: advantage, agricultural food products, competitive, credence attributes, customer attitude, organic

INTRODUCTION

Credence attributes are usually such product features/characteristics that consumers cannot bear out whether before, during or after consuming the products. The customer can only perceive the value and experience it (Darby & E, 1973). In global world, people make choices of agricultural food products on the basis of organic, consumer consciousness for safe, natural, healthy, place of origin of agri food (Nimon & J., 1999) To compete in this dynamic world it has become foremost important for a firm to analyze how customers develop their perceptions and decision to purchase or recommend the food products to others. Many research studies have put it forward that credence attributes have some impact on buying intentions of consumer market and in turn promote the willingness to pay for the products. But the study on why consumers get ready to pay extra for credence attributes is still missing in the literature available. The same phenomenon has been studied in context to the country of origin and labeling on the products (Lusk, J., & J., 2003).

Among the different possible credence attributes in the products, this study aims to fulfill the gap in the literature by studying the impact of credence attribute "locally grown" on the consumer attitude in South Region of Pakistan.

There has been extensive study on the literature in consumer psychology to analyze its relationship with consumers' beliefs in the presence of product attributes, to understand the association with consumer attitudes last but not lastly how consumer becomes ready to pay for it. Attitude is referred as a psychological inclination that is expressed by evaluating a particular entity with some degree of favor or disservice (Eagly & Chaiken, 1993). There is extensive facts that an individual's attitude towards an object is positively associated with social and personal factors that might eliminate the desired relationship (Fishbein & Ajzen, 1980; McFadden, 1986). The impact of product attributes serve as indicator, signals, or cues, on consumers' perceptions of quality and has been an important field of research in consumer psychology. In this particular study,

it is assumed that occurrence of credence attributes have an impact on attitudes of consumers because they are used as a signal of other credence attributes. Some research on the use of the credence attribute country-of-origin as a cue of other attributes has been already conducted in marketing literature, while comparatively little work in this area has been done in the agri-food marketing field (Lusk et al., 2006), with few exceptions (Loureiro & W., 2007). There is evidence that the country-of-origin associated to a product has an important function in increasing consumer's beliefs in the presence of other experience attributes.

A study on consumers of TVs in USA showed that TV sets that are made of Japan are considered to be more technologically advanced than local TVs (Han & V., 1988). The impact of place of origin as a sign of other attributes has been defined by Van der Lans et al. (2001) as indirect effect, as the impact of credence attributes on consumers' willingness to pay for a product is mediated by consumers' perceived quality. Likewise, researches suggest that there is indirect effect of valuable attributes on customer attitude via customer beliefs when it is mediated by consumers' beliefs in the presence of individual product attributes. Some researchers have found that the impact of place of origin of a product on consumers' attitudes is given only by the indirect effect as a mediation of consumers' beliefs in the presence of experience attributes. Most of the researchers have explored that the idea of a place of origin is also attached to a product, and generate consumers

MATERIALS AND METHODS

Target population of the study consisted of the users of different agricultural products in the South Punjab of Pakistan. For this purpose, the students of the higher education institutions of the big cities were selected as the target population of the study. Based on the number of students enrolled in each institution, proportionate sampling procedure was employed to get the enough response

from the respondents. Data were collected through self administered questionnaires. Questionnaire covering all the dimensions of the study were constructed and was distributed to the respondents. Questionnaires of the study consisted of the two parts. In the first part, respondents were asked to provide their demographics information and user of the key products. In the second part, ratings on study's variables were obtained. The overall response rate was 62%.

RESULTS AND DISCUSSIONS

This section offers the results of the study. First, reliability scores of the measures were computed with help of Cronbach alpha technique. Second, the itemized scores of the variables were computed and then mean and standard deviation of the clustered variables were calculated. Third, paired correlation coefficients were run to determine the association among the variables of the study. Fourth, direct effects of the predictors on consumer response were tested while employing simple regression method. Final, the mediating effects of the beliefs of the customers about locally grown products on the relationship between predictors and outcomes were tested with help of multiple regression methods.

Table 1. Descriptive Statistics, Reliability Scores and Correlations among Variables of the Study

Variables	Mean	SD	CLG	BLG	CA
CLG	3.38	.74	.89†		
BLG	3.42	.60	.116	.82†	
CA	3.35	.47	.324**	.409**	.81†

**p<.01, *p<.05, †bold values in diagonals are the reliability scores of the variables

“CLG”= Claims of Locally Grown, “BLG”= Beliefs of Locally Grown, “CA”= Consumer Attitude

The above shows the descriptive statistics, reliability scores and paired correlation among the variables of the study. The bold values in diagonals are the reliability scores of the variables and reliability score is greater than the cut point (.70) showing the adequate reliability of the measures adapted.

Further, the paired correlation results show that all the predictors are positively correlated with consumer response and these results also predict that these variables will significantly influence the consumer attitude.

Table 2. Direct Effects of Predictors on Consumer Attitude

Predictors	Consumer Attitude	
	ΔR^2	β
Claims of Locally Grown Products	.086	.25**
Beliefs of Locally grown	.156	.37**

**p<.01, *p<.05

ΔR^2 is the proportion variance explained by predictor in outcome. β is the regression weight of predictor in regressing the outcome. These results show that direct effects of predictors on consumer response. Locally grown claims has explained 8.6% variance in consumer response but beta coefficient ($\beta = .25$) is statistically significant. Beliefs has more strong impact on consumer response than any other predictor and explained 15.6% of the variance and beta coefficient ($\beta = .37$, p<. 01) is significant and also positive.

This subsection reports the mediation results of brand attitude on the relationship between predictors and consumer response. The standard approach of Barron and Kenny (1986) was employed in order to test the mediation effects and only in two cases the conditions of mediation test were met successfully.

The results indicate the beliefs of the customers have significantly mediated on this relationship and full mediating effect is detected.

CONCLUSIONS

The results have supported the three hypotheses. The predictors' claims of locally grown and beliefs have significant and positive effects on consumer attitude. Among the significant effects, consumer belief has contributed the greater amount of variance and has more strong effects on consumer attitude. The results indicate that the induction of the credence attribute, locally grown agricultural food develops strong perception of the customer about the freshness and healthiness of food that strengthens the beliefs of the customer to response positively towards the purchase of the food items. The people give priority to this credence attribute and prefer to purchase the food item especially in the case of agricultural food items.

REFERENCES

- [1] Darby, M., & E, K., 1973, Free Competition and the Optimal Amount of Fraud. *Journal of Law and Economics* , 67-88.
- [2] Eagly, Chaiken, 1993, *Psychological Attitudes*
- [3] Han, M., 1988, Country-Of-Origin Effects for Uni-National and Bi-National Products. *Journal of International Business Studies*, 235-255.
- [4] Loureiro, M. L., 2007. Estimating Consumer Willingness to Pay for Country-of-Origin Labeling. *Journal of Agricultural and Resource Economics*, 287-301.
- [5] Lusk, J. L., 2003. Demand for Beef from Cattle Administered Growth Hormones or Fed Genetically Modified Corn: A Comparison of Consumers in France, Germany, the United Kingdom, and the United States. *American Journal of Agricultural Economics*, 16-29.
- [6] Nimon, W., 1999, Are Eco-Labels Valuable? Evidence from the Apparel. *American Journal of Agricultural Economics*, 801-811.

RELATIONSHIP BETWEEN AGRICULTURAL LAND SYSTEMS AND WATER USE DURING THE APPLICATION OF PARTICIPATORY IRRIGATION MANAGEMENT

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Abstract

The identification of water rights is essential to the application of Participatory Irrigation Management (PIM) policies. Water and agricultural land have traditionally had strong relationships. We must clarify land tenure conditions and their relationships with water rights. This paper presents the results of studies focused on the relationships between agricultural land systems and water use in several African and Asian countries. It describes different situations related to land systems and water use, as well as the relationships between them. In study areas, in addition to historical backgrounds, land tenure may be associated with the extent to which state, customary, and individual involvements affect farmers' de facto water rights. In general, water rights are clearly established in developed countries because formal administration of land and water resources has been functional and well-established. In developing countries, further institutional arrangements may be required to enable farmers to maintain water rights and increase efficient water use and management. However, no single solution is available. This paper describes how local contexts may vary with respect to land and water tenure. When PIM is introduced into irrigation schemes, it must be carefully integrated into agricultural land systems and the regulation of water rights in target areas. First, a land management system must be developed that secures farmers' rights to ensure rational/optimal use of irrigation water. This offers important implications for rice irrigation and other crops that requires relatively intense and long-term investments in land development and advanced water management.

Key words: irrigation management, rice, tenure system, water right

INTRODUCTION

During the application of Participatory Irrigation Management (PIM) policies, it is essential to identify water rights because those rights could stabilize the environment for agricultural production, ensure equality in water delivery, and avoid conflicts that result from demands for limited water resources. To identify the nature of water rights in a particular location, we must clarify the conditions of land tenure related to those water rights. Forni [7] stated, Land tenure can be defined as the group of rights of

individuals, households, or communities with respect to land. Water also can be accessed under different types of rights. Tenure includes not only property rights, but also use rights of a permanent or seasonal nature. A tenure system may include rights sanctioned both by law and by custom. That is, alongside the formal legal systems, following defined administrative procedures, there also exist customary rules accepted by the majority of users.

To clarify agricultural land systems and water use and their relationship in different contexts,

we conducted literature reviews and field surveys in several Asian and African countries. The results are presented below.

MATERIALS AND METHODS

Study areas are Anuradhapura District in Sri Lanka, Egypt, Ethiopia, Ghana and Japan. As regards information sources, the study depended on literature review, field observation, unpublished documents (Sri Lanka, Ethiopia, Ghana and Japan), and published data by the Ministry of Agriculture and Land Reclamation (MALR) and Ministry of Water Resources and Irrigation (MWRI) for Egyptian case.

RESULTS AND DISCUSSIONS

1. Anuradhapura District, Sri Lanka

(a) Types of rice fields

Anuradhapura District is located in a Dry Zone in Sri Lanka that receives a mean annual rainfall of less than 1750 mm. A distinct dry season occurs between May and September [20]. To make the most efficient use of this seasonally fluctuating rainfall, many reservoirs have been created by building dams across streams. These reservoirs are known as “tanks.” Farmers use rainwater and tank water during rice cultivation. Tanks used to irrigate land less than 80 ha in size are classified as minor irrigation schemes. They are often referred to as “village tanks” because they serve as the central infrastructure of village life.

Rice fields that are irrigated from village tanks can be categorized into several types. One is known as *Purana-wela*, which means “old fields.” *Purana-wela* is type of rice field that was certified as privately owned during the colonial period. Another type of rice field is known as *Akkara-wela*, which means “acre field.” *Akkara-wela* were developed after the colonial period ended. These fields were sold to farmers by the government. They are usually located downstream of or close to *Purana-wela*. *Badu-idama* is an additional type of field that was developed and leased by the government after the Land Development

Ordinance was enforced in 1935 [16]. Nakamura [16] noted that land tenancy at that time was not consistent with current land tenancy, as demonstrated by the *Thattumaru* system, in which farmland is shared among members and cultivation is performed in rotation every few years.

(b) Water rights and water distribution from village tanks

According to the Sri Lankan government, a multitude of acts and ordinances – more than 40 in all- govern many aspects of water. These laws are administered by various government departments, authorities, statutory boards, and local authorities. Still, there are some lacunae, such as the absence of an overall authority for rivers and the absence of mechanisms of allocation to different users, as well as for conflict resolution [20]. However, with respect to minor tanks, no acts or ordinances have been enacted to regulate water rights. Rather, customary water rights and water allocation practices that exist are shown in Table 1.

Table 1. Types of rice fields and water rights

Types of rice fields	Customary water rights	Allocation order of water
<i>Purana-wela</i> : old paddy fields	With	1
<i>Akkara-wela</i> : one-acre paddy fields owned by one person, newer than <i>Purana-wela</i>	Without	2
<i>Badu-idama</i> : leased paddy fields	Without	3

Source: [16]

Tank water distribution is decided at *Kanna* meetings that cultivators join to discuss cultivation issues, including water distribution. *Kanna* meetings are hold prior to each cultivation season. All meetings are conducted in front of administrative officers. Serious discussions are held during dry season meetings because expected rainfall amounts will be low and cultivators must decide on appropriate area to be cultivated. Issues to be decided at *Kanna* meetings include cultivation areas, plowing periods, the number of times dams and canals should be cleaned, water distribution patterns, and fines to be imposed. The implementation of a system known as *Bethma* is one of several issues that must be determined at *Kanna* meetings. Under the *Bethma* system, paddy fields are redistributed

temporarily among farmers to meet with amount of water in a tank. *Bethma* is considered an “effective water use system” that offers cultivation opportunities to all farmers [10]. However, it has been reported that the implementation of *Bethma* has decreased [19].

In areas that rely on village tanks, water is the main resource that must be allocated among the people. The allocation of water is achieved by farmers during *Kanna* meetings in which farmers participate.

2. EGYPT

(a) Landownership and water rights in Egypt

The history of water rights in the Islamic world is complex. However, the application of water rights varies significantly. Most countries permit the ownership of customary private water rights to coexist with state-owned water rights administered by a permission scheme. Several countries, and, in particular, Egypt, tie water rights exclusively to land. The rights and obligations that accompany water rights vary from country to country.

In Egypt, land and water tenure cannot be separated, especially in older rural areas. This exerts a direct impact on water tenure. Thus, water rights are used solely for irrigation. According to Islamic regulations, water cannot be sold. No fees are charged for water used for irrigation of either old or newly-reclaimed lands, with the exception of some locations within newly-reclaimed lands in which fees charged to cover the costs of electrical consumption by water pumping stations are paid by land owners [11]. Therefore, water from the Nile River and public canals is considered the property of all Egyptians. However, it is managed by the State through the Ministry of Water Resources and Irrigation (“MWRI”). Wells are available for public use, as well as for private use as personal property on newly reclaimed lands.

Water used for agriculture consumes about 85% of the annual amount of Egypt’s water resources (55.5 billion m³). Based on the current policy that rations agricultural water,

attempts to save water have been emphasized through agricultural water management (AWM) efforts and improvements made to the conveyance system. Therefore, landowners must submit irrigation schedules that will dictate the amount of water to be allocated. Irrigation scheduling is performed by the Water Users Associations (“WUAs”), with the assistance of an innovative governmental entity known as the Irrigation Advisory Service (“IAS”). Water allocation to farmers is primarily based on the amounts of land involved and cropping patterns. However, in the case of water deficits in *mesqa* (tertiary canal) discharges, water is proportionally distributed among farmers by WUAs [13]. Irrigation schedules list each farmer’s irrigation times and the number of hours *mesqa* gates or valves will remain open. These schedules are implemented by *mesqa* leaders and leaders of gates or valves located along the *mesqa*.

Landowners have certain responsibilities that accompany their water use rights. These responsibilities include keeping the drains, *mesqas*, and canals clean and free of debris. For landowners who hold water rights, a variety of actions are prohibited:

- Wasteful use of irrigation water through drains, fallow land, or unlicensed land.
- Impeding irrigation networks.
- Preventing flows in the main canals or any other actions that might compromise water elevation. In addition, opening or closing any locks or any other regulated works.
- Demolishing any hydraulic infrastructures constructed by the MWRI.
- Excavating the banks or changing their elevations (hack filling mud or).
- Licenses are required for any water-related works or equipment operation.

(b) Allocation of public water in Egypt

The MWRI intends to create a flexible system of water allocation based on factors such as land size and crop rotations. The MWRI is responsible for water distribution in all waterways up to the *mesqa* level and for determining and publishing the irrigation calendar. MWRI reserves the right to modify

the system in accordance with agricultural needs. In fact, the Irrigation Director is empowered to stop the diversion of water from a main canal to ensure more equitable distribution or to avoid over-application.

To irrigate new lands, (i.e. lands that never received irrigation licenses), the MWRI must approve all appropriations to ensure sufficient water is available. Licenses must be obtained from the Irrigation Director. Each licensee must include the following information in the license application: acreage, soil classification, irrigation source, irrigation technology, and cropping calendars. The Irrigation Director must validate the data and determine the amount of water to be allocated and the particular irrigation technology to be used. The law also requires that licenses must be obtained for any water works to be completed on public lands, for any water intakes established on the Nile or on main canals, for the construction of pumping stations, and even for land cultivation. These requirements are designed to increase control of the withdrawal and use of public water resources drawn from the Nile [18].

3. ETHIOPIA

(a) Water rights and land tenure system in Ethiopia

Land, as well as natural resources located on it, is considered property owned by the state in Ethiopia. This has been a constitutional right since 1974. Regional states administer land and other natural resources in accordance with federal and regional states laws. Land is not subject to sale. Individual farmers may own land and they have land use rights. However, they may not sell their land rights. For many years, land owned by farmers was insecure because land-administrators often conducted land redistribution. However, since the early 2000s, rural land ownership has grown increasingly secure because of rural land certification policies. In land certification, each plot owned by a farmer is demarked, registered, and certified. With the exception of selling a plot, a farmer can rent the plot and include it as an inheritance for family members in a legal written agreement. The system has equity advantages. However,

the extent to which land-tenancy will affect sustainability and water use efficiency requires further study.

Ethiopian farmers can access irrigation water from their land and this constitutes their water rights. Other than the right to use the land they own (implicitly, the accessible water), no specific water rights are available in Ethiopia [3] [9]. Basically, water rights regulate farmers' use, access, withdrawal, and alienation of water [3]. Water rights have been established by various legal orders. The lack of defined water rights in Ethiopia limits use and access to water. For instance, because the sale of irrigation land is illegal, only farmers who own land near irrigation water can irrigate. This limitation may cause inefficiency. However, the tenure system does not totally restrict other farmers from accessing water. If a farmer whose land is located far from a scheme wants access to irrigation water, he/she must enter into a written contractual agreement with the farmer who owns a plot located near the scheme to temporarily rent irrigable land. Therefore, more efficient farmers can access irrigable land by renting. Another method used to access irrigation water occurs when the government or a community invests in a new irrigation scheme. At this time, the distribution of irrigation land depends on whether the scheme was constructed on new farmland areas or developed on previously existing farmland area. In a newly developed farmland, the distribution of irrigable land can be easy. However, in previously developed farmlands, individual farmers' access to irrigable land depends on prior agreements made among farmers who belong to water use associations. However, land-related conflicts frequently arise among farmers, despite the existence of prior agreements. These conflicts weaken AWM. With respect to fees in communal irrigation, based on water policies, users pay continuous fees to cover operation and maintenance (O&M) and capital costs.

(b) Water collection methods - Case studies from Ethiopia

Ethiopia's water resource development policies provide evidence that the government

has invested in irrigation projects and has established and implemented procedures for the sustainability and viability of irrigation projects. Based on this objective, the government has implemented a stage-by-stage cost recovery approach. In this approach, fees are based on crop-choices and farm-level profits, scheme efficiency, and simple and clear cost recovery systems [4].

Until now, the per capita membership fee served as the implemented water fee collection system. This is apparent in, for instance, Koga irrigation project in North Ethiopia. The command area of Koga irrigation project occupies 7000 ha. Approximately 12,000 households are the beneficiaries. Per-household irrigable land shares are 0.58 ha per household [6]. In this scheme, beneficiaries are expected to cover all O&M and capital costs [1]. The estimated annual fee per household is about \$251.8/ha/year [14] over the scheme's lifespan. Two vital issues have arisen. First, farmers have objected to the fee: They say it is unaffordable. In addition, Dowa et al. [6] discussed the fact that the scheme appears inequitable: Only farmers must pay for the scheme. Other beneficiaries (i.e. backward and forward linked users such as cattle ranchers) frequently do not pay for shared water. Their failure to pay for shared water could weaken AWM. Furthermore, throughout the lifespan of the project, in many cases, the irrigation fees are constant (similar to the per-household fee for irrigated landholdings). These fees may not cover the full costs because of inflated material costs.

The land administration regulations indicate that farmers who own irrigation lands are not permitted to sell them. However, they are allowed to rent their land. Efficient farmers may face land shortages because they possess small irrigation landholdings (i.e. 0.58 ha). In contrast, inefficient farmers might possess excess land. Land rentals and contract farming can reduce inefficiency. However, in Ethiopia, land rentals frequently depend on social attachments that develop between farmers (i.e. kinship, friendship) rather than on competitive rental fees. Therefore, it can be difficult to

conclude that the tenure system leads to efficient water allocation. The advantage of this type of land tenure lies in the equity created by the distribution of irrigable land.

4. GHANA

(a) Agricultural land system and water use in Ghana

Land distribution in Ghana is primarily governed by customary laws that are partially recognized in the legal framework [17]. Traditional authorities often manage land allocation in rural areas, although allocation patterns vary from region to region based on local customs. The authorities administer water rights in localities and manage water conservation, pollution control, and the protection of catchments and fisheries [21]. With respect to irrigation scheme sites, traditional authorities continue to play substantial roles in land allocation, and water use monitoring and management. They create and enforce rules and engage in conflict resolution related to land and water access [5]. Prevailing customary systems generally characterize the tenurial conditions under which farmers cultivate lands (implicitly, they affect water allocation because riparian water rights are commonly acknowledged in Ghana). These conditions are associated with the multi-layered and dynamic nature of land rights that may pose challenges to successful PIM establishment in areas that include inland valley bottoms located in southern regions considered suitable for the installation of small-scale rice irrigation systems.

(b) Land-water relationships: Small-scale rice irrigation in Southern Ghana

In southern Ghana, chiefs and their extended families customarily possess land titles (stool lands). A specific farmlands holds several individuals (e.g. the chief, family, and cultivator) who possess potential claims over the landholding. Formal land registration (i.e. titles) to ensure individualized rights is precluded. Therefore, an individual will not possess exclusive rights to improve his/her cultivated land over time. This creates a challenge that may impede the extended transformation of valley bottoms into irrigated rice fields.

In contrast to policy approaches that tend to require clearly-defined property rights, African customary systems are characterized by ambiguity that has allowed people to create tenure arrangements that require further (re-) interpretation & (re-)negotiation to accommodate different norms and interests based on ethnicity, ancestry, gender, and age [2]. In southern Ghana, cash crops (e.g. cocoa) have attracted settlers from other regions for decades. Several types of power mechanisms, including mechanisms used to control land holdings (e.g. indigenous and immigrant) and transactions (e.g. matrilineal and patrilineal) exist simultaneously. However, these mechanisms have gradually changed because of the existence of different modes of individual adoption and revision [12]. This dynamic nature sometimes creates tensions during tenant cultivation, which might compromise the contracts (e.g.—rent might increase), militate against tenants' shares of the return (and, thus, reinvestments), and, ultimately, cause their eviction. These risks should be anticipated, particularly in leased rice fields, for the following reasons: 1) because farmlands suitable for rice irrigation are, among others, limited, they may attract relatively high local demand. Hence, tensions related to access and use can readily arise. 2) These tensions may accelerate as land values and prices increase because of improvements made to field and irrigation infrastructures. 3) Risks will be protracted by long-term land tenancy that is often arranged to enable farmers to recoup their upfront investments. 4) Risks may increase because of the successive arrival of new settlers (the landless) who hope to discover relatively accessible farm lands, such as rice fields used for irrigation.

To weather the above challenges and to sustain PIM, it is essential to foster local institutions that promote farmers' collaboration in AWM for rice fields, as well as to consider the tenure status embedded in farmers' social customs and relationships.

5. JAPAN

(a) Farmland management system in Japan

Rights to farmland in Japan are managed by the Agricultural Land Act that addresses the following issues: 1) only farmers and farmers' groups whose main businesses is farming are allowed to own, use, derive profits, and transfer farmland; 2) to transfer ownership, permission must be obtained from an agricultural committee comprised of farmers who reside in the same municipality, based on the Public Officers' Election Act; and, 3) to change the purposes of farmland, permission must be obtained from the Minister of the Ministry of Agriculture, Forestry, and Fisheries ("MAFF") or the Governor of the Prefecture.

(b) Institutional characteristics of water rights related to agricultural water use

Japan enjoys an average annual precipitation of 1,690 mm. However, seasonal gaps in rainfall occur frequently. The amount of available water resources in Japan fluctuates widely on a yearly basis. For example, the amount of useable water resources available during a standard dry-year that occurs once every ten years stochastically (10-year volume) equals two-thirds of the amount of useable water resources available during a normal year [15]. Because many stakeholders want to use river water, limited water rights that include fixed terms are provided to each stakeholder by the river administrator ("RA") (either MLITT or the local government). Therefore, all stakeholders can use the same amount of water they might use to achieve 10-year volume. If a new stakeholder wants to obtain new water rights to use river water, the stakeholder must apply to the RA for permission to use the volume of water the stakeholder requires. The RA may provide water rights if a distributive surplus water resource is available. However, the RA might provide water rights later if further water resource development is required. Almost all cases that requested new water rights for agricultural water during the past few decades required new water resource development.

In 1896, the original Water Law for the administration of river water-use was legislated. Prior to the law's enactment, river water was extracted for various purposes.

However, stakeholders in relevant areas voluntarily negotiated with one another to establish usage. Adjusted shares were later recognized as Traditional Possessions (TP) of water rights. Each user was expected to inform the RA of the volume of TP used. In all cases, when unanticipated water shortages occur, stakeholders must negotiate to keep damage to a minimum.

The following restrictions on water rights have been imposed (Fig. 1):

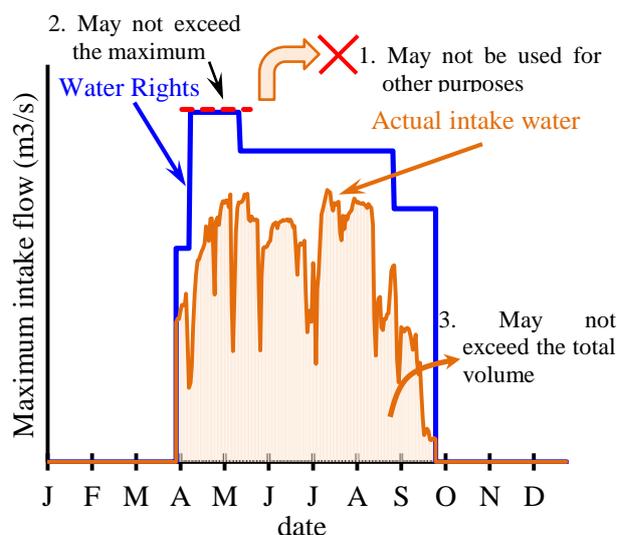


Fig.1. The concept of water right restrictions for the removal of river water

1. Do not use water for purposes other than the specified purpose and area.
2. Do not use water that exceeds the maximum flow during each period.
3. Do not use exceed the total allowable water volume during productive periods.

(c) Water charge collection methods in Japan

Developing countries struggle to collect water charges that can be used for O&M and/or management fees for irrigation facilities. However, this has not been problematic in Japan because Land Improvement District (“LID”) offices can officially collect fees from member farmers. Approximately 95% of the LIDs in Japan collect fees based on farmland areas possessed by each individual member [8]. Overall, Japan has clearly defined land and water use rights. This

ensures fair water allocation and timely fee collection. Clearly-defined water rights also ensure the collection of fees from individuals who share water (e.g.—municipalities) and improve AWM.

CONCLUSIONS

Based on the case studies described above:

In the Dry Zone of Sri Lanka:

- Water is the main property that must be considered. Land and land tenancy can be arranged to allow water use, as demonstrated in the *Tattumaruru* and *Bethma* systems. Farmers’ participation in irrigation management is achieved during *Kanna* meetings, as well as by the enforcement of customary water rights.

In Egypt:

- Water rights are tied to the land. Thus, they are tied to land ownership. Most agricultural land is privately owned. Water is distributed according to a defined time schedule among different land parcels within a certain location based on a conveyance that depends on the land’s location and its proximity to the main source of water.

In Ethiopia:

- Land is owned by the state. The state offers land use opportunities to farmers. Water rights that should be connected to land use have often been transferred by farmers. Recently, land certification has created better opportunity for such a transfer than in the past.

In Ghana:

- Traditional systems frequently affect agricultural land-water relationships. In southern regions, the multi-layered and dynamic nature of land rights may negatively affect successful PIM in both owned and rented rice fields. It is crucial to understand the mechanism that operates behind local tenure arrangements (i.e. coping strategy) to foster farmers’ organizations.

In Japan:

- Japan has determined clearly defined land and water-use rights that ensure fair water

allocation and timely fee collection. Clearly-defined water rights also ensure collection of fees from individuals who share water (e.g. municipalities) and improve AWM.

These results demonstrate that a proper understanding of the relationships that exist between agricultural land systems and water use is critical to the establishment of PIM. Therefore, irrigation projects should be carefully designed to match agricultural land systems and the regulation of water rights in target areas. Thus, it is important to develop land management systems that secure farmers' rights to make rational/optimal use of irrigation water. This has important implications for rice irrigation in particular because it requires relatively high and long-term investments in land development and advanced AWM.

REFERENCES

- [1] African Development Fund. 2001, Koga Irrigation and Watershed Management Project: Appraisal Report.
- [2] Amator, S.K., Ubink, M.J., 2008, Contesting land and custom in Ghana: Introduction in Amator, S.K., Ubink, M.J. (eds.) Contesting land and custom in Ghana. Leiden University Press.
- [3] Bues, A., 2011, Agricultural foreign direct investment and water rights: An institutional analysis from Ethiopia, International Conference on Global Land Grabbing, IDS- University of Sussex, 6–8 April 2011, Sussex, England.
- [4] Cherre, S., 2001, Irrigation Policies, Strategies and Institutional Support Conditions in Ethiopia, Ministry of Water Resource Development, Addis Ababa, Ethiopia.
- [5] Derbile, K.E., 2012, Water users associations and indigenous institutions in the management of community-based irrigation schemes in North-eastern Ghana. *European Scientific Journal*, 8(26): 118–135.
- [6] Dowa, A.A., Noel, S., Shone, G., Barron, J., Soussan, J., 2007, Water and poverty linkages in Africa: Ethiopia case study, Stockholm Environment Institute.
- [7] Forni, N., 2001, Land tenure systems: structural features and policies. FAO Technical Report GCP/SYR/006/ITA, Rome, FAO.
- [8] Fujimoto, N., 2005, Diversity of Agricultural Water Management—An Analysis of the Policies in the People's Republic of China, 2005 Annual Research Report of National Institute of Rural Engineering in Japan, 23–65.
- [9] Gebreselassie, S., 2006, Land, land policy, and smallholder agriculture in Ethiopia: Options and scenarios, *Future Agriculture, Discussion paper No. 008*, University of Sussex, UK.
- [10] Hiraiwa, M., 2009, Analysis on the Bethma System in the Huruluwewa Irrigation Scheme in Sri Lanka. *Water, Land, and Environmental Engineering*, 77(6), 477–481. [in Japanese]
- [11] Hvidt, M., 2000, Water Resources Planning in Egypt. *Middle Eastern Environment*, St Malo Press, www.netcomuk.co.uk/~jpap/hvidt.htm
- [12] Ishii, M., 2004, Practical logic of land inheritance: A case of multiethnic cocoa-producing region in Southern Ghana. *African studies*, 64, 3–18. [in Japanese]
- [13] Madbouly, M.K., 2005, Egypt Case Study. Report presented at Dry lands Development Center Stakeholder Workshop on Equitable Access to Land and Water Resources, 28–30 Nov. 2005, Beirut. arabstates.undp.org/contents/file/Egypt.doc
- [14] Marx, S., 2011, Large-scale irrigation in the Blue Nile Basin: Chances and obstacles in implementing farmers' self-management: A case study of the Koga irrigation and watershed management project in Amhara Region, Ethiopia, IWMI, February 2011.
- [15] Ministry of Land, Infrastructure, Transport, and Tourism, 2012, Water resources in Japan, 218 [in Japanese]
- [16] Nakamura, H., 1988, Preface of research on water use in Sri Lanka, Ronsousya, Tokyo, Japan, 299. [in Japanese]
- [17] Pande, R., Udry, C., 2006, Institutions and development: A view from below. *Advances in Economics and Econometrics*. Cambridge University Press, London.
- [18] Pluijmers, Y. 2000, Land Tenure and Cadastral Issues in Egypt: 2000 B.C. to the 21st Century. University of Maine. <http://www.spatial.maine.edu/~yvette/yvette.html>
- [19] Somarathna, H.M., Kono, H., 2005, Indigenous institutions for irrigation water management and sustainable agriculture: A case study from Sri Lanka. *Journal of Agricultural Development Studies*, 15(3). 69-76.
- [20] Survey Department Sri Lanka (ed), 2007, The National Atlas of Sri Lanka (Second Ed.), 243.
- [21] van Edig, A., Engel, S., Laube, W., 2003, Ghana's water institutions in the process of reform: From the international to the local level in Reforming Institutions for Sustainable Water Management, Neubert et al (eds) German Development Institute, Bonn, Germany.
- [22] World Bank, 2010, Arable Land (% of Land Area) in Egypt. *Trading Economics.Com*. <http://www.tradingeconomics.com/egypt/arable-land-percent-of-land-area-wb-data>

FINANCIAL ASPECTS OF ACTIVITY IN THE STUDEFARM - SLATINA, OLT

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Abstract

In 1920 was established stallions deposit Brebeni in order to improve horses from Oltenia. Deposit began to operate effectively in 1928 with a staff of 20 heads, until 1984 when it was founded Slatina stud on Repository stud structure, which was moved to the location in Slatina. During 2002 the unit went into administration Romsilva National Forest as OLT Forestry Department Section. The unit is located in Slatina, Recea Street, no. 24, about 2 km from Slatina on DJ 653 Slatina - receive. In terms of administrative membership unit can be found on the municipality Slatina. Unit promotes its activities through participation in exhibition events (fairs, exhibitions, public events, etc.), Supply breeding stallions for public breeding resorts consultations for reproduction, horse riding, dressage, equestrian leisure and tourism. 2010 is the year of minimum and year 2011 is maximum in terms of value (level financial indicators) - in most cases, except for external expenses, personal expenses, insurance expenses, adjustments for property, loss of use, the current and Gross (including related rates).

Key words: equipment, expenses, income, loss, profit, race

INTRODUCTION

Slatina stud horse station within the Forestry Department Olt being elite farm closed circuit strictly supervised under veterinary report.

The specific activity is increasing, maintenance, and improvement of genetic material for breeding breeds Furioso North-Star and Shagya Arab.

In terms of employment, we can speak of three categories of staff: staff directly productive - consisting of 24 employees (28 carers, three mechanized and one carpenter) indirectly productive staff - consisting of three employees (two receivers and distributors 1 driver) TESA staff of 7 employees (head of stud, the chief accountant, veterinarian, two agronomists, secretary and coach).

From the point of view of existing genetic material is noted there Furioso North-Star races and Shagya Arab, with the recommendation to insist on the second race, the first being adapted to the area harder and harder marketable.

During 2002 - 2008, the unit conducted 158 conception products (from 14 foals in 2004 to 36 foals in 2006), delivered annually from 18

to 94 foals for public copulation resorts.

Providing the necessary feed was achieved through efforts related to managing their forage base of 575 hectares, planted with fiber (60-70%), juicy green mass (10-15%) and concentrated (20-25%). Over time, in terms of ensuring the necessary fodder unit faced with situations both surplus and deficit situations, acting as the supply from various sources and by keeping surplus or sales.

Land administered by the unit is 594 ha, of which the predominant agricultural land - 575 ha (538 ha arable land and 8 ha of natural grassland), while non-agricultural land has only 38 ha (29 ha protective curtains, 14 ha courtyards and buildings 5 hectares roads).

Material facilities are found as shelters for horses - 11 spaces, warehouses for grain - 2 spaces, mechanical workshops - 2 spaces, shelter Hay - three spaces, two apartment, three tractors, agricultural machinery 14.

At the level of unit is not present infectious diseases, not too many problems sanitary veterinary and the mortality losses ranged from 1.4 up to 5% of the total staff (2002 and 2008).

When determining the incomes on agricultural holdings distinction should be made between farm income and agricultural income. This difference shows that at the level of holdings can be deployed and non-agricultural activities that can increase total income, with positive effects on farm viability.

The complexity of determining the income of farmers is given by the level of consumption, specifics of area the production, the production costs, the national economy and rural economic environment [3].

In the agricultural holdings costs are equivalent to the total consumption of factors - human and material to obtain a certain quantity of goods and services [1].

Gross weight gives information on the degree of profitability of agricultural holding by reporting the absolute profit to the cost of the production process.

Financial management is involved in the distribution of the net profit from the economic development fund and retention the employees and shareholders towards supporting a profitable production process [2].

MATERIALS AND METHODS

Conceiving the paper involved conducting a series of work operations that started documenting (through the use of financial reporting data analysis unit) [4]. In the second phase has switched to the processing of such data, based on using the method of comparison over time and composition of the related structures for some of the indicators. The indicators have been grouped as follows: indicators of income, expenditure indicators and profitability indicators. The data collected and analyzed covers the period 2010-2011, and using period average.

RESULTS AND DISCUSSIONS

Indicators of income. Table 1. present the level of income indicators for the period 2010-2011. The first major category of revenue is the revenue from exploitation. This includes production sold, income subsidies, turnover,

cost of production income for progress and other income.

Sold production was 127,701 lei in 2010, then in 2011 it increased 3.32 times reaching 426 655 lei. In these conditions the average was 2.16 times greater than the reporting base - 276 178 RON.

Revenues from grants are an important part of the turnover, which stood at 954,043 lei in 2010, 428,721 lei in 2011 and 691,382 lei for period average. One can see their decline 55.1% in 2011 compared to 2010, the average representing only 72.5% of the comparator.

Turnover averaged 967,560 lei (-10.6% compared to 2010), which is based on average values sequential 1,081,744 lei in 2010 and 853,376 lei in 2011 (-21.1%).

Revenue from running production cost increased from 468,851 lei in 2010 to 529,072 lei in 2011 (+12.8%), so that the average period reached 498,961.5 lei (6.4%).

Regarding other incomes, we can see that they were only 17447 lei in 2010, then increased to 570 341 lei for 2011 (32.7 times). Average indicator was 293,894 lei - 16.8 times compared with the reporting base (2010).

View of the situation described above were determined operating revenue, which is as follows: 1568042 lei in 2010, 1,952,789 lei in the year 2011 and 124.5% over the previous period, 1,760,415 lei for the average period (+12,3).

Unit recorded interest income, very modest - 2 lei in 2010, 86 lei for 2011 respectively an average of 44 lei.

In the case of 2011 are recorded other financial revenues - 5162 lei.

Total financial income was modest in 2010-2 lei grew spectacularly in 2011 (5248 lei), with an average of 2625 lei.

The unit has not recorded extraordinary income, so the total revenue of the combined exploitation and the related financial ones. Such quotas were reached 1568044 lei in 2010, 1,958,037 lei in 2011 (24.9%) and the average of the period 1,763,040.5 lei (12.4% growth compared to the reporting).

Table 1. Income indicators (-lei-)

CRT. NO.	SPECIFICATION	2010		2011		AVERAGE	
		EFFECT.	DIN.	EFFECT.	DIN.	EFFECT.	DIN.
1.	Sold production	127701	100	424655	3,32 times	276178	2,16 times
2	Income from subsidies	954043	100	428721	44,9	691382	72,5
3	Net turnover (1+2)	1081744	100	853376	78,9	967560	89,4
4	Income cost of production in progress	468851	100	529072	112,8	498961,5	106,4
5	Other income	17447	100	570341	32,7 times	293894	16,8 times
I	Income from operations (3+4+5)	1568042	100	1952789	124,5	1760415,5	112,3
6	Interest income	2	100	86	43,0 times	44	22 times
7	Other financial income	-	-	5162	100	2581	50,0
II	Financial income (6+7)	2	100	5248	2624 times	2625	1312,5 times
III	Extraordinary income	-	-	-	-	-	-
IV	Total revenues (I+II+III)	1568044	100	1958037	124,9	1763040,5	112,4

Annual spending. Table 2. present the level of expenditure indicators for the period 2010-2011. Administrative expenses and related goods based: raw material cost, material costs and other external costs. Thus it can be seen that the first category of expenditure has reached the 802,576 lei in 2010, 988,944 lei in 2011 (+23.2%) and 895 760 lei for the average of the period (+11.6%).

The category of other material expenses are recorded an average of 4749 lei - 103.9% compared with 2010 -, a value that is based on 4569 lei levels for 2010 and 4929 lei for 2011 (+7.9%) .

External costs ranged at 37 164 lei shares in 2010, 36,520 lei in 2011 - down 1.7% compared to the reporting deadline - 36,842 lei for the average of the period (99.1% in dynamics).

Total expenditures for materials and goods was 844,309 lei in 2010, 1,030,393 lei in 2011 (+22%) and 937,351 lei for the period average (111.0% in dynamics).

Personnel costs consist of salaries and insurance, the situation is as follows: salaries reached 478,602 lei in 2010, increased by 17.2% in 2011 (561 089 lei), an average of 519,845.5 lei (+8.6%) insurance costs had an

average of 146,777.5 lei (99.9% compared to the benchmark), which is based on an average of 146 982 lei sequential levels in 2010 and 146,573 lei for of 2011 (-0, 3%), staff costs have reached 625,584 lei in 2010, 707,662 lei in 2011 (+13.1%) and 666,623 lei in the period average (+6.6%).

Adjustments to assets were 54,797 lei for 2010 reached 39,547 lei in 2011 (-27.8%) and an average of 47172 lei for of the period average (86.1% compared to the reporting).

Regarding the situation of other operating expenses (external services, other taxes, fees - payments, compensation donations transferred assets), there is an average value for period of 269,817.5 lei (+29.0% compared to 2010 - reference period), 209,154 lei in 2010 and 330,481 lei in 2011 (58.0%).

Following these statements, above, has reached a level of operating expenses, as follows:

- 1733844 lei for 2010;
- 21008083 lei in 2011 (21.6% - in dynamics);
- 1,921,063.5 lei period average (10.8% compared to the first term of the dynamic series).

Table 2. Annual spending (-lei-)

CRT. NO.	SPECIFICATION	2010		2011		AVERAGE	
		EFFECT.	DIN.	EFFECT.	DIN.	EFFECT.	DIN.
1	Raw materials and supplies	802576	100	988944	123,2	895760	111,6
2	Other material expenses	4569	100	4929	107,9	4749	103,9
3	Expenses (water, energy)	37164	100	36520	98,3	36842	99,1
4	Total expenditures for materials and goods (1+2+3)	844309	100	1030393	122,0	937351	111,0
6	Salaries	478602	100	561089	117,2	519845,5	108,6
7	Insurance expenses	146982	100	146573	99,7	146777,5	99,9
8	Personnel expenses (6+7)	625584	100	707662	113,1	666623	106,6
9	Adjustments	54797	100	39547	72,2	47172	86,1
10	Other operating expenses (external services, other taxes - taxes - payments, compensation donations, assets transferred)	209154	100	330481	158,0	269817,5	129,0
I	Total operational expenses (4++8+9+10)	1733844	100	2108083	121,6	1921063,5	110,8
11	Interest expense	-	-	-	-	-	-
12	Other financial expense	-	-	-	-	-	-
II	Financial expenses (11+12)	-	-	-	-	-	-
III	Extraordinary expenses	-	-	-	-	-	-
IV	Total expenditure (I+II+III)	1733844	100	2108083	121,6	1921063,5	110,8

Profitability indicators. Table 3. present the level of profitability indicators for the period 2010-2011.

It is noteworthy, unfortunately, that the unit does not make a profit but losses. Profit appears only for financial activities (2 lei in 2010, 5248 lei 2011 and 2625 lei to the average period).

Operating loss was 165,802 lei in 2010, 155,294 lei in 2011 (-6.3%) and 160 548 lei for the period average (-3.2%).

Current loss decreased by 2 lei in 2010 compared to operating loss (165800 lei), with 5248 lei for the year 2011 compared to the same baseline (150,046 lei, -9.5% compared to 2010), averaging of 157,923 lei (-5.2% compared with the comparator).

Above values are equal to those of gross and net loss, as we have extraordinary profit or loss or tax.

Operating loss rate was -9.56% in 2010, fell to -7.37% in 2011 (-22.9% compared to the first term of the series dynamic), and the average was -8,36% (-12.6% in dynamics).

Regarding the current loss rate that was identical in 2010, with the operating loss rate (-9.56%), financial profit of only 2 lei failed to decisively influence this. For 2011, the

indicator showed a value of -7.11% (74.4% of the reporting), while the average was -8.22% (14% in dynamic).

Whereas there is no extraordinary profit or loss, gross loss ratio is equal to current loss rate, and that tax is not paid to make those values translate the for net loss rate.

CONCLUSIONS

Th observation of the unit is an activity strictly specialized in breeding horses that have special character, taking into account the mission to deliver genetic material for breeding;

In the total revenue structure, the prevailing operating income increased by 99.85%, while financial income was only 0.15%. The category of operating revenue turnover prevailed (54.88%), followed by revenues from production cost (28.30%), other income representing 16.70% (Fig. 1);

The total expenditure is equal to operating expenses, which are comprised of 48.79% material costs, personnel expenses 34.71%, 14.05% and other operating expenses 2.45% adjustments on assets (Fig.2);

Table 3. Profitability indicators

CRT. NO.	SPECIFICATION	U.M.	2010		2011		AVERAGE	
			EFFECT.	DIN.	EFFECT.	DIN.	EFFECT.	DIN.
1	Loss from operations	lei	-165802	100	-155294	93,7	-160548	96,8
2	Financial profit	lei	2	100	5248	2624 ori	2625	1312,5 ori
3	Current loss (1-2)	lei	-165800	100	-150046	90,5	-157923	95,2
4	Extraordinary profit or loss	lei	-	-	-	-	-	-
5	Gross loss (3+4)	lei	-165800	100	-150046	90,5	-157923	95,2
6	Income tax	lei	-	-	-	-	-	-
7	The net loss (5-6)	lei	-165800	100	-150046	90,5	-157923	95,2
8	Operating loss rate	%	-9,56	100	-7,37	77,1	-8,36	87,4
9	Current loss rate	%	-9,56	100	-7,11	74,4	-8,22	86,0
11	Rates of extraordinary profit or loss	%	-	-	-	-	-	-
12	Gross loss ratio	%	-9,56	100	-7,11	74,4	-8,22	86,0
13	Rates of net loss	%	-9,56	100	-7,11	74,4	-8,22	86,0

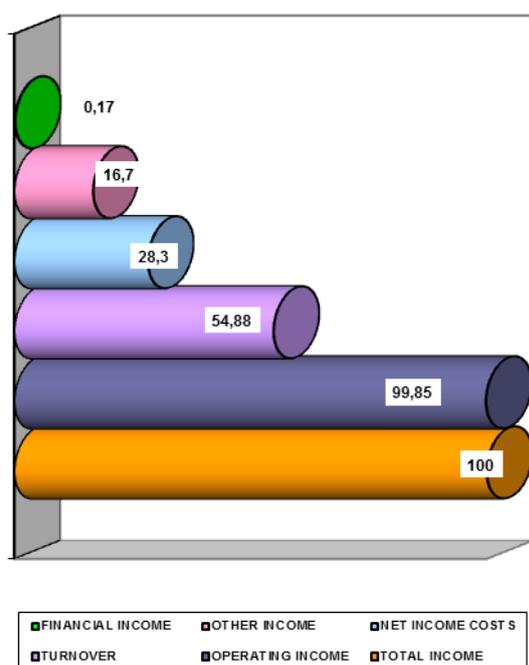


Fig.1. The ratio of total income and its main components (%)

The unit recorded an operating financial profit and loss, and as a result the latter was reduced by the value of the first. Current loss translates to the gross and net loss, as the unit does not pay income tax and does not make any extraordinary profit or loss;

The loss rate was below 10%, but have pursued the ways to reduce it and get profit;

The problems are complex due to the activity profile, on the one hand, due to the work carried out in public, on the other hand. In this context underlined the importance of subsidy without which unit would be a doomed and lost - subsidy exceeds 2.50 times the sold production (691 382 compared to 276 178 lei).

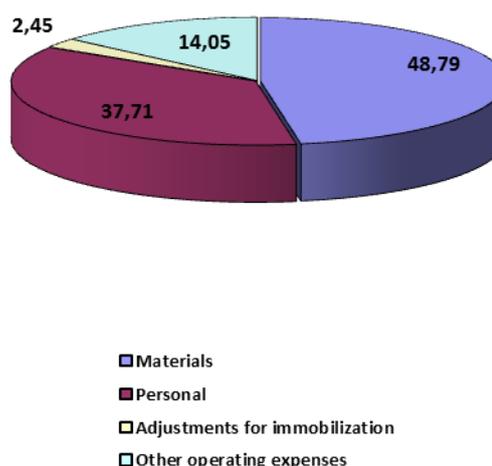


Fig. 2. Structure of total expenditure (%)

REFERENCES

[1]Barbu, C., Pânzaru, R.L., 2000, Agricultural Economics, Hyperion Publishing House, Craiova, Chapter 6, Part I, pp. 89-99

[2]Pânzaru, R.L., Medelele, D.M., Stefan, G., 2007, Elements of management and marketing in agriculture, Universitaria Publishing House, Craiova, Chapter 5, p 93-115

[3]Stefan, G., Bodescu, D., Toma, A.D., Pânzaru, R.L., 2007, The economy and agri-food chain, Alpha Publishing, Science, Chapter 8, p 267-315

[4]Forestry Department Olt Slatina Stud, Accounting data, 2010-2011

PRIMARY MILK OFFER IN CASTRANOVA VILLAGE, DOLJ COUNTY

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Abstract

Castranova village is situated in the south-eastern county of Dolj on county road Leu - Visina (35 km from Craiova), limited in the north by the commune Leu, Apele Vii to the east of village, south and west by the commune Marsani and Bratovoieşti. Commune is composed of villages and wells Castranova. In the village there are 12 agricultural companies and two companies. Specific of the area is agriculture, mainly large crop: wheat and maize farming. Simultaneously develop livestock sector, and milling and bakery activities. Elucidating the communal potential, of milk production is based on use of an appropriate set of indicators: effective in exploitation (by species), total production and average yield per head. The study covers the period 2010-2012, taken as a starting point for developing a strategy of reviving the sector of production.

Key words: livestock, meat production, potential

INTRODUCTION

Productive use of animal species is based on the importance of the food industry, for the capitalization of some secondary forage resources, the use of labor resources, source of export items, profit source [1].

The characteristics of the capital animal are: animals constitutes a conversion - convert feed into meat and other vegetable products, milk and so on, is a "equipment" alive, it renews itself, to the detriment of the final product, is an organized grouping: flock base. Basic herd has a structure corresponding to each species and growth guidelines.

For choosing of animal breeds is appreciated following: features on the requirements to natural factors and to environmental conditions, genetic potential for yield practicable to attain (average milk yield - l / day feeding) daily average weight gain - g / day feeding, average wool production - kg / capita, average egg production - piece / cap., specific consumption of food (feeder units (UN) / l milk, UN / head, UN / kg weight gain in weight, kg feed / kg gain of weight gain etc..) feed rations structure required; consumption of labor required; reaction to intensification; specific investment, payback period [3].

The livestock structure is influenced by the particularities of breeding of different species, breeding system practiced towards of production, herd size used, etc. [2].

MATERIALS AND METHODS

Making the work was based on running two stages stage or office documentation and processing. After the documentation in the territory [4], data processing was performed by using the comparison method in time and composition of structures based on certain indicators used. The data collected and analyzed covers the period 2010-2012, using also the average period.

RESULTS AND DISCUSSIONS

Table 1 shows the production of milk for the main species that are found at Castranova commune level, analyzing livestock sacrificed (Fig. 1), total meat production that was obtained (fig. 2) and the average milk yield (fig. 3).

In the structure of milk production are to be found animals in the following species: cattle, sheep and goats.

It can be observed that in the milk production of cows, the bovine animals used ranged from 176 heads in 2010, up to 210 heads in the case

of 2012, while the average period reached 196 heads. Upward trend emphasizes the dynamics of herds: 14.2% in 2011 compared with 2010, 19.3 also 4.5% in 2012 to the terms of reference (2010 and 2011). Average ahead of 1.11 times the first term of the dynamic series, but is less by 6.7% compared to the previous term dynamic series.

For sheep herds used in the production of milk ranged from 1,500 to 1795 heads for the

years 2012 and 2010 respectively. Under these conditions average of the period reached 1648 heads (-9.2% compared to 2010 and 9.9% compared to the specific situation of 2012). Dynamics of indicators underlines the downward trend, of its successive annual declines were 8.1% in 2011 and 9.1% respectively for 2012.

Table 1. The milk production

No. crt.	Specification	Year									Average 2010-2012		
		2010			2011			2012			Effective	Dynamic	
		Effective	Dynamic		Effective	Dynamic		Effective	Dynamic			Effective	Dynamic
	F _{bi}	M _{bi}	F _{bi}	M _{bi}		F _{bi}	M _{bi}		F _{bi}	M _{bi}	F _{bi}		M _{bi}
1	Number in exploitation (head)												
1.1.	- cattle	176	100	100	201	114,2	114,2	210	119,3	104,5	196	111,4	93,3
1.2.	- sheep	1795	100	100	1650	91,9	91,9	1500	83,6	90,9	1648	91,8	109,9
1.3.	- goats	485	100	100	267	55,1	55,1	205	42,3	76,8	319	65,8	155,6
2	Total production (hl)												
2.1.	- cow milk	8448	100	100	10000	118,4	118,4	9660	114,4	96,6	9369,3	110,9	97,0
2.2.	- sheep milk	2690	100	100	2500	92,9	92,9	1900	70,6	76,0	2363,3	87,9	124,4
2.3.	- goat milk	2610	100	100	1130	43,3	43,3	800	30,7	70,8	1513,3	58,0	189,2
3.	Average production (l/cap.)												
3.1.	- cow milk	4800	100	100	4975	103,7	103,7	4600	95,8	92,5	4780	99,6	103,9
3.2.	- sheep milk	150	100	100	152	101,3	101,3	127	84,7	83,6	143	95,3	112,6
3.3.	- goat milk	538	100	100	423	78,6	78,6	390	72,5	92,2	474	88,1	121,5

For goats has averaged 319 heads, with limits of variation from 205 heads in 2012 to 485 heads in 2010. The indicator is placed on a strict descendent trend, the dynamics is dominated by the subunit levels of component index (55.1% in 2010, 42.3 and 76.8% in 2012, 65.8% of the average of period - compared to the first dynamic within the series). The only over-unit value of dynamic characterized the average of period - 155.6% - compared to previous term (2012).

Total milk production of cows was between 8448 hl in 2010 to 10000 hl in 2011, the average of period being 936937 hl. Dynamics of indicators highlights fluctuations, the trend being an increasing one (18.4 and 14.4% respectively in 2011 and 2012 compared to the first term of the dynamic series, -3.4% in 2012 compared with the previous period of the dynamic series). Average exceeds by 10.9% the first term of the dynamic series, but 3.0% lower than previous term (2012).

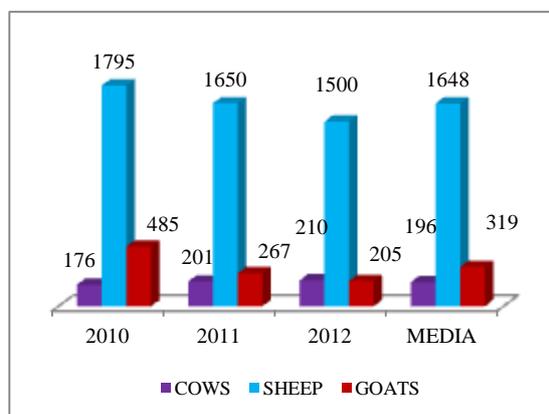


Fig. 1. Total livestock used in the production of milk (heads)

In the case of sheep there was a average milk production of 2363.3 hl (-12.1% compared to the year 2010, 24.4% compared with the previous term of the dynamic series), which is based on sequential annual levels of: 1900 hl in 2012 (-29.4 and -24.0% compared to the years 2010 and 2011), 2500 hl in 2011 (-7.1%

compared with the first series of dynamic) 2690 hl for 2010.

Goats provided between 800 and 261 hl of milk (2012 and 2010), an average of 1513.3 hl (in conditions of 1130 hl in 2011). Dynamics of indicators highlights the evolution strict descendant - decreased by 56.7% in 2011 compared to 2010, 69.3 and 29.2% respectively compared with the terms of reference in 2012 to 42.0% in average compared to the first term of the period in the dynamic series (over-unit value for mobile based indexes - 189.2%).

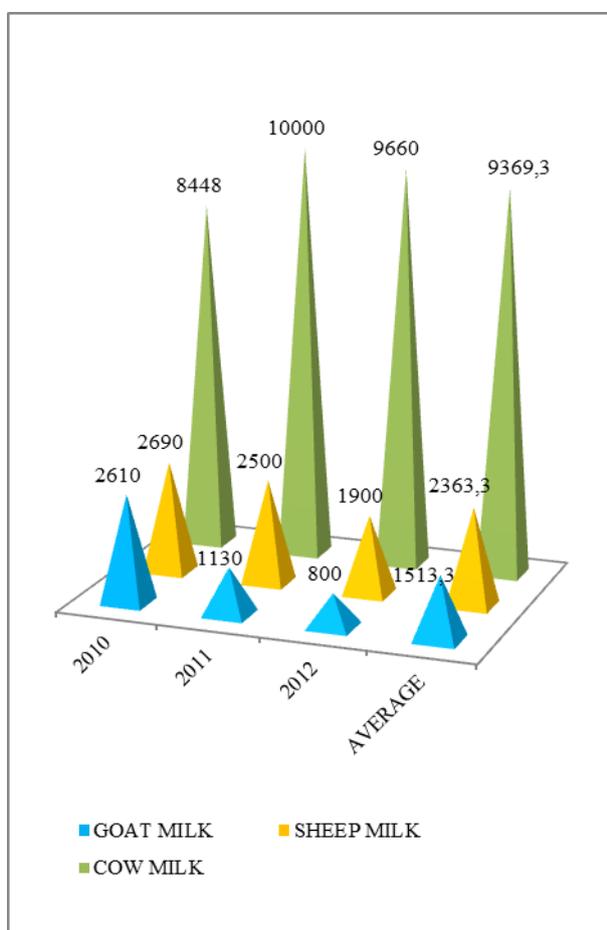


Fig. 2. Total milk production (hl)

In the case of the average milk yield the situation is as follows: the average production per cow was 4780 liters, variation limits from 4600 to 4975 l - in 2012 respectively 2011. Indicator evolved unevenly, but low limits (exceeding maximum of the reference term was 3.9% - for mobile based indices, on period average, while the largest decrease was

-7.5% in 2012 from the previous term dynamic series) for sheep the average milk yield ranged from 127-152 l (2012 and 2011), average of the period being of 7143 l. Dynamics of indicators underlines timid growth in 2011 (+1.3% compared with 2010), decreased for 2012 (-15.3 and -16.4% respectively to the terms of reference), and placement under and over reporting bases for average of the period (-4.7 and 12.6% respectively compared to 2010 and 2012); goats is characterized by an average milk production of 474 l (period average) than the absolute variations were: - 84 l in 2012 l in 2011 and 64 -51 l for 2010. Indicator evolved descendent for the period under review (dynamics is dominated by the subunit levels of component index, exceptions for those with mobile base on period average - 121.5%).

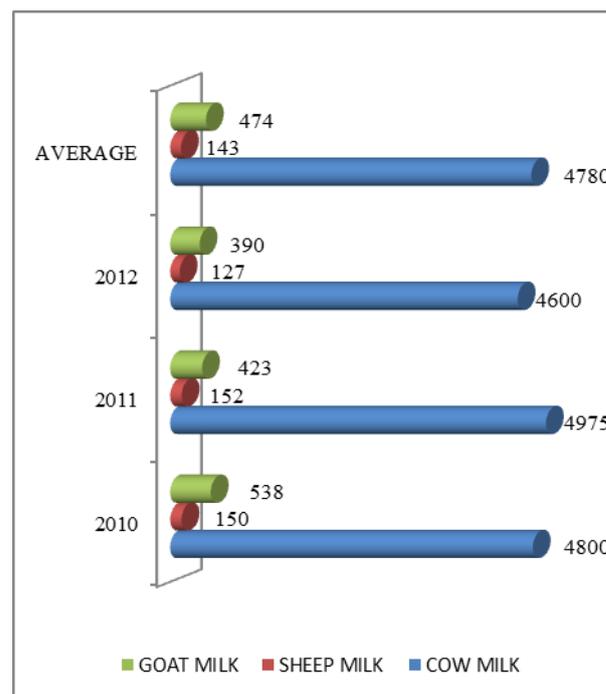


Fig. 3. Average milk production (l/cap)

CONCLUSIONS

The Commune Castranova, by its surface, represents 0.91% of the total surface at county level and can be considered a medium-sized village for Dolj County taking into account the existing 114 administrative territorial units (municipalities, cities and towns).

If we compare the total production related to the livestock sector, the situation of the county, we can emphasize the following weights: 1.08% of the total milk production of cows (9369.3 to 871 000 hl) 1.22% of total milk production (13245 9 to 1.086 million hl), 1.80% of sheep and goat milk (3876.6 to 215000 hl);

The total milk production structure (13245.9 hl) was as follows (Fig. 4.): 70.73% cows milk, sheep milk 17.84%, 11.43% goats milk; d. is noted the need to develop zootechnical sector, both in terms of reinvigorating the herds, and through the angle of improving the structure for race so as to achieve proper operation of the existing potential, both in terms of natural and socio-economic point of view. It can exploit the potential of the area suitable for sheep and goats than cattle - growing poorer, due to the existence of sandy soils.

[4] City Hall Castranova, Statistical Reporting Data, 2010-2012

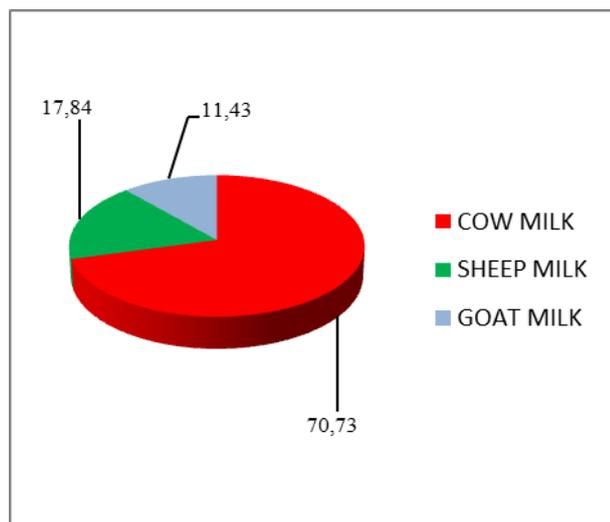


Fig. 4. The structure of milk production - period average (%)

REFERENCES

- [1]Barbu, C., Pânzaru, R.L, 2000, Agricultural Economics, Hyperion Publishing House, Craiova, Chapter 7, Part II, p 331-365
- [2]Pânzaru, R.L, Medelete, D.M, Stefan, G., 2007, Elements of management and marketing in agriculture, Universitaria Publishing House, Craiova, Chapter 6, pp. 116-148
- [3] Ștefan, G., Bodescu, D., Toma, A.D., Pânzaru, R.L., 2007, the economy and agri-food chain, Alpha Publishing, Iași, Chapter 3, pp. 53-157

ECOLOGICAL FOOTPRINT FROM THE SUSTAINABILITY PERSPECTIVE

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Abstract

The paper studied the importance of Ecological Footprint (EF) for estimating the biologically productive area. Since the Ecological Footprint is a measure of renewable biocapacity, we argue that some dimensions of ecological sustainability should not be included in the Ecological Footprint. These include human activities that should be phased out to obtain sustainability, such as emissions of persistent compounds foreign to nature and qualitative aspects that represent secondary uses of ecological areas and do not, therefore, occupy a clearly identifiable additional ecological space. We also conclude that the Ecological Footprint is useful for documenting the overall human use or abuse of the potentially renewable functions and services of nature. Particularly, by aggregating in a consistent way a variety of human impacts, it can effectively identify the scale of the human economy by comparison with the size of the biosphere.

Key words: ecological area, ecological footprint, impact, renewable biocapacity, sustainability

INTRODUCTION

The Ecological Footprint (EF) concept, introduced by Rees and Wackernagel (1994), measures the biologically productive area necessary to support current consumption patterns, given prevailing technical and economic processes.[20] Dividing all the biologically productive land and sea on this planet by the number of people inhabiting it results in an average of 2,3 ha per person, less than one third of what is necessary to accommodate a typical Canadian footprint. If we put aside 12% of the biologically productive space for preserving the other 30 million species with whom we share this planet (WCED, 1987) which, by the way, is politically ambitious but ecologically insufficient, the available space per capita shrinks to 2 ha. With an anticipated global population of 10 billion for the year 2050, the available space will be reduced to 1,2 ha per person. Already, the average Italian uses 210% more than is available per capita worldwide, or 320% more than is available per Italian within their national territory. Sweden is still one of the fortunate few

countries whose ecological footprints are smaller than their national biologically productive space. Worldwide, however, humanity's footprint may exceed global carrying capacity by 30% - in other words, humanity consumes more than what nature can regenerate and is decreasing the globe's natural capital stock. It is not only the non-renewable and renewable resources that are declining but also the ability of nature to assimilate the waste (for example, emissions of carbon dioxide or acidifying substances). The ecological footprint builds on a variety of earlier analytical attempts to measure human load in order to estimate the dependence of human life on nature (see for example, Martinez-Alier, 1987 and Cohen, 1995). [15], [4]. Much intellectual groundwork for more recent studies was laid in the 1960s and 1970s, particularly by initiatives such as Georg Borgstrom's analysis of "ghost acreage" (1973), Howard Odum's energy analysis examining systems through energy flows (1994), Jay Forrester's advancements on modelling world resource dynamics as presented by the Club of Rome (Meadows et al, 1972; Meadows et al, 1992), John Holdren

and Paul Ehrlich's IPAT formula (1974), or, in the spirit of the International Biological Programme, Robert Whittaker's calculation of net primary production of the world's ecosystems (Whittaker, 1975; Lieth and Whittaker, 1975). [2], [18], [16], [17], [13], [6] The last ten of fifteen years have witnessed exciting new developments of tools that measure people's use of nature: life cycle assessments, energy analyses and energy-based lifestyle appraisals (Pimentel et al, 1994; Hofstetter, 1991), environmental space calculations going back to ideas of Johann Opshoor and further developed by the Friends of the Earth (Buitenkamp et al, 1993), human appropriation of net primary production (Vitousek et al, 1986; Fischer-Kowalski, 1997), documentation of regional and industrial metabolisms, mass intensity measures such as Mass Intensity per Unit of Service (MIPS) (Schmidt-Bleek, 1994), measures of human processes such as the Sustainable Process Index (SPI) (Krotscheck and Narodoslowsky, 1996), socio-ecological indicators, resource accounting input-output models (Duchin and Lange, 1994), computer based spatial models analyzing land-use developments and ecological potentials, computer-based scenario models such as "PoleStar" (Gallopín et al, 1997), or the above-mentioned ecological footprint assessment (Wackernagel and Rees, 1996; Folke et al, 1997), to name a few. [19], [12], [3], [22], [8], [21], [14], [5], [10], [23].

MATERIALS AND METHODS

In this section, we discuss how the EF relates to the four principles for sustainability described in the previous section. We also explain how the EF could be developed to incorporate more aspects of the principles for sustainability. Further, we discuss which aspects of the principles are more relevant to measure using other methods. Before we relate the EF to the four principles, we present, as background, some general properties of the EF concept. The main question that the footprint answers is how much biologically land would be

required on a continuous basis to provide the necessary energy and resources consumed by a population and to absorb the wastes discharged by the population. An EF analysis, therefore, is close to an assessment of human appropriation of net primary production (or NPP). The principal difference from other NPP studies is that the footprint expresses the results in spatial measurement units rather than energy or mass equivalents.

EF estimates are calculated to account for as many ecological impacts as possible without exaggerating humanity's current impact. For example, optimistic yield figures are used and some impacts are not yet included in the calculations. In addition, the estimates do not double count areas that can give several services simultaneously, since this would exaggerate people's true use of nature. Underestimating human use of nature's productivity ensures that the EF results do not depict the ecological situation as more severe than it. This chosen strategy secures the widest possible acceptance of the results.

Both people's EF and the biosphere's areas of biologically productive land are expressed in common units: world average land with world average productivity. In most assessments, official data are used – not because they are the most accurate, but to delegate responsibility and show that even with the official data, once interpreted from an ecological perspective, significant new conclusions can be generated.

The EF calculations have so far included land for energy supply, food, forest products, and the built environment, degraded areas, and sea space for fishing. For the waste side, the land needed for sequestering CO₂ is included in the EF. There are attempts to include more aspects of the waste side, such as phosphorus retention and denitrification (Folke et al, 1997; Wackernagel et al, 1998). [9]

RESULTS AND DISCUSSIONS

Fossil fuels and carbon dioxide

There are three different approaches to calculate the footprint of fossil fuel consumption – and all three results in

approximately the same area. All three are motivated by the idea that, in order to be sustainable, humanity must not undermine functions and biodiversity of the ecosphere. This is the essence of the first three principles for sustainability.

One way to calculate the EF for fossil fuels would be to account for the corresponding area needed for the sustainable production of biofuels. The rationale for this way of calculating would be the close relationship between fossil fuels and bio-fuels, such as methane or ethanol. They have the same origin (photosynthesis), they are of similar quality and they can be applied in almost the same technological systems (in combustion engines for instance). The required productive area for that type of energy supply, built on closed carbon cycle (i.e. no net increase of CO₂ in the atmosphere), would then be the rational basis for the EF calculation. This method would lead to the biggest footprint estimates for fossil fuel. However, there is some considerable controversy about the degree to which bio-fuels can substitute for the global use of fossil fuels considering the competition for land areas for other purposes like food, materials and biodiversity (Berndes, 1997; Giampietro et al, 1997; Hall et al, 1997). [1], [11]

Another way of calculating the fossil fuel footprint would be to calculate the area needed to compensate only the biochemical energy of the burned fossil, without taking into account that the biochemical energy in the woods has not the same technical quality as fossil fuel or bio-fuels. This would lead to slightly lower ecological footprints for fossil energy.

The third method is based on CO₂ sequestration, arguing that the amount of fossil fuel may not be the limiting factor but rather the absorption of the waste gases. In this method, the area is calculated by assessing the extension of newly planted forest required for sequestering the CO₂ released by the combustion of fossil fuel. Such land serves as a CO₂ sink during a period of between 40 to 100 years, depending on climate and species of forest. In order not

to release the sequestered CO₂ the mature forest would have to be left for the future with no harvest, so spontaneously renewing itself. As the absorbing forests mature, additional forest areas for CO₂ sequestration would be needed in order to avoid increasing levels of CO₂ in the atmosphere in the case of continued use of fossil fuels. Obviously, this third method leads to the smallest footprints for fossil fuel. It is chosen because it avoids results which could exaggerate human impact of fossil fuel use. Nevertheless, the accumulation of CO₂ in the atmosphere from the use of fossil fuels is only one of many impacts this energy system has in the ecosphere. Therefore, the current conversion rate of 71 gigajoules per hectare and year for liquid fossil fuel-based on sequestration estimates published by the Intergovernmental Panel of Climate Change – are still significant underestimates of this energy's true ecological load on the biosphere (Wackernagel et al, 1997). In addition, no significant land area is set aside exclusively to sequester CO₂ from fossil fuel burning (or for the replacement of fossil fuels by wood biomass). [24]

In conclusion, all three methods described above have their limitations. For example, a real transition from fossil fuels to bio-fuels should lead to a smaller footprint area – current footprint accounting practice, however, should show the opposite. These methods are, though, helpful for the monitoring of increased overall efficiencies of the energy system, as well as the transition towards much more area-efficient sources of energy, like photovoltaics. (Besides being area-efficient, photovoltaics have the additional benefit of not needing to occupy biologically productive surfaces). The third method has the advantage of giving the smallest area of the three methods and does not, therefore, exaggerate the area needed. This method is also more relevant when considering emissions of CO₂ from other sources than fossil fuels (for example, cement production since it is not based on a substitute for the energy supply).

Waste assimilation (apart from carbon dioxide)

The waste assimilation, apart from CO₂, has hitherto not generally been considered in EF assessments. Only some newer assessments of the EF include the use of space for breaking down biodegradable waste, particularly in water (Wackernagel et al, 1998). For example, the area of ponds and protective wetland areas which should be needed for effective reduction of the load from leaching plant nutrients from productive agricultural land have been included in a detailed calculation of the Swedish national footprint. [25]

A systematic inclusion of such waste in EF calculations is difficult because the assimilation capacities in the ecosphere are known only for a few of the naturally occurring substances. In these cases, the anthropogenic flows of such a substance can be converted to an area needed for assimilating the substance.

Relevant anthropogenic flows to consider are actual emissions of substances to the ecosphere or, alternatively, the potential emissions estimated from the extraction rate of virgin substances from the lithosphere or, in the case of human made products, the amounts of these substances manufactured. For a region, the net import of substances should be added to the extraction and production of substances within the region.

When assimilation capacities are not known, it can be possible to indirectly estimate them, for example, by considering some natural flows. The assimilation capacities of metals are usually not known, but can be assumed to be proportional to their natural flows, such as in their weathering and sedimentation rates. If the anthropogenic flows of a metal are much larger than the natural flows, the risk increases that such flows will cause accumulation in the ecosphere. The anthropogenic flows of a metal could be converted to an area proportional to an area from which the same amount of metal will be weathering. A difficulty is that the natural concentrations and weathering rates vary for different regions.

To avoid double counting of productive areas and erroneously large footprints, it is necessary to consider that the area needed for

assimilation of substances can still be made applicable for other purposes, for instance, productive forests and crop land, provided that these areas are not destroyed because of high concentrations of the emitted compounds. Further, the same area can be applied for the assimilation of more one compound. We define additive aspects as those that can be added to each other when calculating the total footprint without risk of double counting of area, e.g. food and fibre production. In contrast to exclusive (primary or additive) aspects, the secondary (or non-additive) aspects should not be added to each other since the same area can be used for several of these aspects, e.g. assimilation of substances can be done on the same area as is used for fibre production. Note that built-up land is also an additive aspect but this area cannot be used for assimilation of substances. If none of the emissions of compounds exceed their assimilation capacities corresponding to the productive area needed for additive aspects, there is no need to add any productive area occupied by this function to the footprint area, i.e. $A_{footprint} = A_{additive\ aspects}$. On the other hand, if some of the emissions of compounds exceed their assimilation capacities of the productive area needed for additive aspects, the footprint should increase the more the assimilation is exceeded. The most appropriate strategy would then be to calculate how much the productive area for assimilation of the most dominant compound would need to be extended in order not to have accumulation of that compound:

$$A_{footprint} = A_{assimilation} + A_{built-up\ land}$$

The assumption that then needs to be made is that the various compounds would not influence each other's assimilation thresholds in the ecosystems, or each other's impact on the ecosystem. That assumption is often true, but not always. It is definitely not true for various compounds that lead to acidification (like emissions of SO₂ and NO_x), and that add to each other's negative effects on area productivity. On the other hand, this could be adjusted for by simply adding the corresponding areas for such compounds that have additive impacts on the ecosystems

productivity into a sum. Here, H^+ equivalents from different compounds could be used. If that sum exceeds the needed extension of the assimilation area for any of the other compounds that can be estimated to be independent of each other, this sum should then be applied to the footprint. And conversely, if any of the ‘independent’ compounds – say a plant nutrient – has a needed extension of area that exceeds all other areas calculated, including the sum of H^+ assimilating areas, that would be the appropriate area for the footprint.

Substances for which it is not possible to estimate their assimilation capacities cannot be considered in the EF method and have to be accounted for in some other way. Also, substances that have such low assimilation rates that the EF would become absurdly large may not be compatible with a sustainable society. Since the EF only includes potentially renewable aspects of the human economy, these not-sustainable substances cannot be included in the accounting. Another assessment problem for potentially renewable substances, however, can be to find data for anthropogenic flows of substances such as emissions and the net intake of substances.

A shift to a substance with lower equivalent impacts (for example a more naturally abundant metal) would give a smaller area for the same amount of anthropogenic flows. This way of calculating substances could thus be used as an indicator measuring the progress towards sustainability.

Compounds foreign to nature

Often compounds that are not normally occurring in the ecosystems cannot be made part of footprinting calculations because assimilation capacities for such substances usually cannot be identified.

Built-up land

Paved-over land, built upon land and hydropower dams are counted according to the space they occupy in the present EF method. Areas lost (or damaged) because of industrial activities, including mining, should also be included, but are still left out because of unavailable data.

Forestry and agriculture

Present timber and crop yields are used in most EF analyses, optimistically assuming that these could be maintained. Hence, anthropogenic influence on long-term productivity and biodiversity is underestimated when analyzing forestry and agricultural productivity. Still, badly eroded or otherwise degraded land where the total productivity has been lost is deducted from the bioproductive areas. Biodiversity is considered to the extent that the bioproductive land is decreased by a (probably too small) area set aside to preserve biodiversity.

The production capacity of forests and agricultural land varies depending on natural factors such as climate and soil. Anthropogenic influence can also affect the production capacity. These effects are covered in EF accounts by including factors that compare local bio-productivity to the global average. When production capacity has been systematically deteriorated on a long-term basis by current practice, the loss should be reflected in the EF assessments. This, however, has not yet been included, which once more underlines that EF results are underestimates. Loss of conditions for maintenance of biodiversity should also be reflected in the bio-capacity accounts. When lost production capacity and lost biodiversity are known for a specific forestry area or agriculture, an area needed to compensate for these losses could be added to the actual forest area or agricultural land in the footprint value. When the losses are not known, template values for losses based on practices used in forestry or agriculture could be used. For example, a smaller area is needed to compensate for losses when site-adapted forestry is practiced rather than when large-scale conventional forestry is practiced. And, an even smaller area is needed to compensate for losses when environmentally certified forestry is practiced. In agriculture, for example, the decrease of long-term productivity caused by soil compacting could be estimated based on soil type and machine pressure.

The production capacity can increase when a large amount of fertilizer is used in agriculture. This means that less agricultural land is needed for the same yield. It should be noted that additional areas are needed (such as ponds and protective zones to avoid nutrient leakage) and land to supply the energy (or to assimilate CO₂ emissions) is required for the production of fertilizers.

For more accurate results, forestry and agriculture should be supplemented by other indicators documenting losses of production capacity and conditions for maintenance of biodiversity, both of which have not yet been captured by EF accounts.

Fisheries

In earlier footprint analyses, we did not include sea space, because the sea does not provide a significant proportion of the food or any other resource humanity consumes (.To be more complete, however, present EF analyses now include sea areas to the extent that they provide for food. The footprint of fisheries is calculated by comparing the fish harvest with the ecological production within an average sea area. Obviously, this is not a sophisticated reflection of the role of the sea but helps to document the magnitude of the various uses of nature.

Studies with a specific focus on the EF of fisheries have been completed by Folke et al (1998). [9]

For more detailed future studies, one could consider not only the amount of fish but also what species are caught because different species have different sustainable yields, and also to what extent sea space is lost because of excessive waste loads. This approach would more clearly point out the potential for over-harvest and extinction of fish species, and would make the EF more relevant for indicating the sustainability of humanity's use of the sea. However, because there is significant controversy about the sustainability of fisheries and the impact of waste, and as far more sophisticated assessment methods exist for analyzing marine resources, it may not be particularly effective to use the footprint as an additional assessment tool. Rather, the footprint

methodology is effective as a means to present the research results of these more sophisticated assessments in an ecological context.

Water use

Freshwater available in nature can be divided into two forms (which are both recharged from precipitation):

- (1) As 'green' water in the soil, returning to the atmosphere, and
- (2) As 'blue' water in aquifers and rivers flowing towards the sea.

The green water directly supports the process of biomass production. Since the transformation of harvested biomass to an ecological footprint has already been covered in the agriculture and forestry section, this water does not need to be accounted again for the footprint analysis. The blue water, on the other hand, can supply households with domestic water, the industry with water for cooling and other processes, and agriculture with irrigation water. The ecological footprint of such a use can be calculated in relation to the amount of the water used.

There are two main categories of the use of blue water:

(1) Evaporative (consumptive) water use sending the used water back to the atmosphere after use (i.e. the use of water for irrigation). The ecological footprint of evaporative water use can be calculated as the catchment area that corresponds to the amount of water used. An example of non-sustainable evaporative water use is the decline, caused by irrigation, of ground water in large agricultural areas in the US. The ecological footprint of declining ground water can be calculated as the recharge area of the aquifer that corresponds to the excess use of the actual recharge (renewable yield) of the aquifer.

(2) Through flow-based use (just circulating the water through the societal system), returning it back to the landscape or river after use with a load of pollutants added during use. The ecological footprint of such a use can be based on the pumping energy used and the pollution added and not on the use itself since no water is evaporated.

Besides the actual use of water, the actual supply it decreased through various means of manipulation. Examples are surface hardening through, for instance, growing constructed areas within the technosphere, 'natural' loss of productivity, deforestation, or hardening after adding the exclusive bioproductive areas necessary to capture the water, the area necessary to compensate for lost bioproductivity caused by deviated water and areas to cleanse the water again. These areas are not only calculated for the water directly used by a population, but also for producing the goods and services this population receives from elsewhere.

Qualitative impacts on freshwater that will not directly require an additional bioproductive area necessary to remediate it, as in the case of contamination with persistent human-made compounds, requires other measures to track them.

Area efficiency

Besides these flow-related aspects, the area efficiency, for example, in agriculture, forestry and energy systems, will become more and more important. Even though most EF results are expressed in global average forest and agricultural productivities, variations of area efficiency between regions and regional changes of area efficiency over time can be documented if specific yield factors replace average figures in footprint calculations.

Transmaterialization and dematerialization

For the flows that are included in the EF calculation, transmaterialization and dematerialization are indirectly considered. If a material that needs less area for assimilation substitutes for a material that needs more, the area for that application will be smaller. And, obviously, if less of a material is needed through dematerialization, the area needed to assimilate the flow will be smaller. This means that the progress towards sustainability for transmaterialization and dematerialization can be measured for certain flows.

Distribution of resource use

The distribution of resource use can partially be documented by the EF. In some projects,

the distribution of the EF within societies has already been calculated.

It is possible to reflect intergenerational justice of distribution of resource use within regions if the EF is calculated for different groups within society, e.g. different income groups, rather than whole regions. Even though the EF reports about the ecological capacities currently occupied, it does not document whether these spaces are actually sufficient for meeting the needs of people. Intergenerational justice is considered in as far as ecological deficits are identified. These deficits lead to an accumulated ecological debt burden for future generations.

Population growth

Population growth is indirectly considered since the available productive area per capita will decrease when the population grows.

CONCLUSIONS

An essential part of sustainable development is to reduce the throughput of resources in relation to the added human value. All processes degrade the quality of energy, and more or less waste is generated. From a thermodynamic point of view, those „bills” must be paid for through processes run by energy from outside the ecosphere. The sun-driven biogeochemical cycles of nature are essential to maintain life on Earth. Therefore, most of those bills must, in the end, be paid for by productive areas receiving sunlight. Consequently, the method of footprinting, relating various throughputs of resources to the respective fertile areas required, offers an attractive possibility of auditing sustainable development.

A culture's lifestyle, with its demands of services on the one hand, in combination with its technical and organizational skills to provide services per throughput of resources on the other, gives us the footprint, and then calculating the footprints for various options, more resource efficient way of meeting human needs can be evaluated and launched. So, the EF is not only relevant for estimating the situation with regard to the areas needed

to sustain us today, but also for testing different strategies for the future.

The footprint is particularly effective for documenting human use or abuse of the potentially renewable functions and services of nature. Aspects that need to be monitored with other indicators and measures are activities that should be phased out completely, or almost completely, to obtain sustainability, and certain qualitative aspects of sustainability that are not easy or relevant to transfer to spatial measures. In other words, the EF does not cover all aspects encompassed by the systematic sustainability perspective used in this paper, but is consistent with its thrust. In addition, it offers a quantitative interpretation of central aspects of the systematic sustainability perspective and puts their more abstract criteria into a more tangible measurement. Therefore, the EF is a complementary tool to the principles for sustainability: as a yard stick for measuring the ecological bottom-line of the renewable use of the biosphere – a precondition for securing people's quality of life.

REFERENCES

- [1] Berndes, G., 1997, Estimates of biomass energy supply prospects: a review. In *On societal utilization of biomass for food, energy, and materials*. Licentiate thesis. (Goteborg: Department of Physical Resource Theory, Chalmers University of Technology and Goteborg University)
- [2] Borgstrom, G., 1973, *Harvesting the Earth*. First published under the title *World Food Resources*. (New York: Abelard-Schuman)
- [3] Buitenkamp, M., Venner, H. and Wams, T. (eds), 1993, *Action Plan Sustainable Netherlands*. (Amsterdam: Dutch Friends of the Earth)
- [4] Cohen, J.E., 1995, *How Many People Can the Earth Support?* (New York: W.W.Norton&Co)
- [5] Duchin, F. and Lange, G.M., 1994, *The Future of the Environment: Ecological Economics and Technological Change*. (Oxford: Oxford University Press)
- [6] Ehrlich, P., Holdren, J., 1972, One-dimensional ecology. *Bulletin of Atomic Scientists*, 28 (5), 16 and 18-21
- [7] Falkenmark, M., 1996, *UN World Food Summit, Report 7*. (Rome: FAO)
- [8] Fischer – Kowalski, M., Haberl, H., Huttler, W., Payer, H., Schandl, H., Winiwarer, V., Zangerl-Weisz, H., 1997, *Gesellschaftlicher Stoffwechsel und Kolonisierung der Natur*. (Amsterdam: G+B Verlag)
- [9] Folke, C., Kautsky, N., Berg, H., Jansson, A., Troell, M., 1998, The ecological footprint concept for sustainable seafood production: A review. *Ecological Applications*, 8 (1 suppl.), Feb., S63-S71
- [10] Gallop, G., Hammond, A., Raskin, P., Swart, R., 1997, *Branch Points: Global Scenarios and Human Choice*. PoleStar Series Report No.7 (Stockholm Environment Institute)
- [11] Giampietro, M., Ulgiati, S. and Pimentel, D., 1997, Feasibility of large-scale biofuel production. *Bioscience*, 47 (9), 587-600
- [12] Hofstetter, P., 1991, *Personliche Energie- und CO₂-Bilanz*. Second draft. (Zurich: Buro fur Analyse und Okologie)
- [13] Holdren, J., Ehrlich, P., 1974, Human Population and the Global Environment. *American Scientist*, 62, 282-92
- [14] Krotscheck, C., Narodoslawsky, M., 1996, The Sustainable Process Index: A New Dimension in Ecological Evaluation. *Ecological Engineering*, 6, 241-58
- [15] Lieth, H., Whittaker, R.H. (eds), 1975, *The Primary Productivity of the Biosphere*. (New York: Springer)
- [16] Martinez-Alier, J., 1987, *Ecological Economics: Energy, Environment, and Society*. (Oxford: Basil Blackwell)
- [17] Meadows, D., Meadows, D., Randers, J., 1992, *Beyond the Limits*. (Toronto: McClelland & Stewart Inc.)
- [18] Meadows, D., Meadows, D., Behrens, W., 1972, *Limits to Growth*. (New York: Universe Books)
- [19] Odum, H.T., 1994, *Ecological and General Systems*. revised edition. (Boulder: University of Colorado Press)
- [20] Pimentel, D., Herdendorf, M., Eisenfeld, S., Olander, L., Carroquino, M., Corson, C., McDade, J., Chung, Y., Cannon, W., Roberts, J., Bluman, L., Gregg, J., 1994, *Achieving a Secure Energy Future: Environmental and Economic Consequences*. *Ecological Economics*, 9 (3), 201-219
- [21] Rees, W.E., Wackernagel, M., 1994, *Ecological Footprints and Appropriated Carrying Capacity: Measuring the Natural Capital Requirements of the Human Economy*. In Jansson, A-M., Hammer, M., Folke, C. and Constanza, R. (eds) *Investing in Natural Capital: The Ecological Economics Approach to Sustainability*. (Washington DC: Island Press)
- [22] Robert, K-H., Daly, H., Hawken, P., Holmberg, J., 1997, *A Compass for Sustainable Development*. *International Journal of Sustainable Development and World Ecology*, 4, 79-92
- [23] Schmidt-Bleek, F., 1994, *Wiewiel Umwelt braucht der Mensch? MIPS Das Mass fur okologisches Wirtschaften*. (Basel: Birkhauser Verlag)
- [24] Vitousek, P.M., Ehrlich, A.H., Mateson, P.A., 1986, Human appropriation of the products of photosynthesis. *BioScience*, 34(6), 368-373

[25] Wackernagel, M., Lewan, L., Lewan, L., Folke, C., Hansson, C., 1998, Evaluating the Sustainability of a Catchment Area: The Ecological Footprint Concept Applied to Malmohus County and the Kavlinge Watershed, Southern Sweden. Draft.(Sweden: Lund University) WCED (The World Commissions on Environment and Development) (1987). Our Common Future. (Oxford: Oxford University Press)

ESTIMATION OF EXPENSES, INCOME AND PROFIT IN MULBERRY TREE GROWING

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Abstract

The paper aimed to comparatively analyze the economic efficiency for two experimental variants in Mulberry tree growing as follows: V1 – Mulberry plantation 0.5 ha + Layer maker 0.5 ha; V2 – Mulberry plantation 0.5 ha + Seed Field 0.2 ha + Layer maker 0.1 ha + Sowing Field 0.2 ha. The V2 variant assured Euro 51,915.49 profit, while V1 just Euro 3,675.41 profit. Therefore, the most profitable variant is V2. This means that production diversification in mulberry tree growing could have positive effects leading to an increased profitability. The hierarchy of the variants was made based on profit that the sericulturist could get in the first 8 years of activity when mulberry plantation will reach the maximum production.

Key words: costs, income, mulberry tree growing, production diversification, profit

INTRODUCTION

Mulberry tree is a perennial plant, mainly spread in the plain and hilly areas of Asia, Europe and America. In Romania, the decline of silk worm rearing after 1990 did not stimulate the establishment of new plantations and the existing ones remained in the communities property or were given back to the old owners (Matei A, 2000, Baiski D., 2009). Mulberry tree is used in sericulture, medicine, food and wood industry, as it could be processed in many useful products (Tanase D., 2009). Its leaves are juicy and rich in nutrients suitable for silk worm feeding (Jayab M.M. *et al.*, 1962). They are rich in a high value protein (15-35 %), minerals (2.42-4.71 % Ca, 0.23-0.97% P), energy 1.130-2.240 kcal/kg (Saddul *et al.*, 2004). The protein could be compared with soy bean protein. The high digestibility of the mulberry leaves recommend them to be used in feeding various animal species replacing partially oil plants such as: in cattle feeding (Datta R.K. *et al.*, 2012), in sheep feeding (Liu J.X. *et al.*, 2012), in goats feeding (Miller D. *et al.* 2000), in chicken feeding (Al-kirshi R.A. *et*

al. 2009), in laying hens feeding (Olteanu M., *et al.*, 2010), in fish feeding (Mondal K. *et al.*, 2012). Mulberry leaves are rich in tannin, aspartic acid, folic acid, argininE, minerals, a reason to be used in medicine for treating various diseases. White and black fruits are rich in sugar, C vitamin, betacaroten, tannin and minerals. They are tasty and juicy fruits being consumed as such or processed in jam, cakes, alcoholic drinks and vinegar. Mulberry tree is used for fixing sandy soils and its wood is processed in furniture, musical instruments, wheels, paper.

Mulberry tree growing imposes various expenses which could be covered by income if production is diversified. In this context, the paper aimed to estimate costs, income and profit in mulberry tree growing under a diversified production in order to offer alternatives to farmers for increasing profitability if cocoon market is not operating.

MATERIALS AND METHODS

The research started from a model of family sericultural farm of 1 ha agricultural land, of

which 50 % mulberry plantation and 50 % nursery and 150 square meters for silk worm rearing. Two experimental variants were organized within SC Sericarom SA as follows: V1 – Mulberry plantation 0.5 ha + Layer maker 0.5 ha; V2 – Mulberry plantation 0.5 ha + Seed Field 0.2 ha + Layer maker 0.1 ha + Sowing Field 0.2 ha. Based on the technological sheets for each variant, the following costs were estimated: tillage, setting up the plantation and its maintenance, as well as by cost item: materials, labor, thirds, depreciation, energy, water, direct and indirect costs, total costs. Income resulted based on production and market price for each product. Financial results were estimated for the first 8 years of activity, because it was considered that in the 8th year, mulberry plantation will

reach the highest performance. All the calculations were made in Euro.

RESULTS AND DISCUSSIONS

For V1 variant, expenses with soil tillage are similar for microplantation and layer maker. The costs for setting up and maintenance of layer maker are higher than in case of microplantation (Table 1).

Cost structure for V1 variant consists of: 55.61 % materials, 32.50 % labor, 3.07 % thirds, 2.62 % energy and water (Table 2).

In case of V1, cost structure included: materials 55.61 %, labor 32.50%, thirds 3.07 %, depreciation 0.51 %, energy and water 2.62 %. Direct costs represented 94.33 % of total costs.

Table 1.Costs V1-Microplantation 0.5 ha + Layer maker 0.5 ha (Euro

Specification	Costs with soil tillage	Costs for setting up plantation	Costs for plantation maintenance in the 1st year	TOTAL costs
Microplantation 0.5 ha	857	3,999	433	5,289
Layer maker 0.5 ha	857	4,101	3,272	8,230
Total Costs V1	1,714	8,100	3,705	13,519

Source:Own calculations.

The implementation of V2 variant requires Euro 1,684 for soil tillage, Euro 8,234 for setting up the microplantation, seed field,

layer maker, sowing field and Euro 1,345 Euro for maintenance. About 50 % of total costs of Euro 11,263 belong to microplantation for leaves (Table 2).

Table 2.Costs V2-Microplantation 0.5 ha+ Seed field 0.2 ha + Layer maker 0.1 ha + Sowing field 0.2 ha (Euro)

Specification	Costs with soil tillage	Costs with microplantation setting up	Costs with microplantation maintenance in the 1st year	TOTAL costs
Microplantation 0.5 ha	857	3,999	433	5,289
Seed field 0.2 ha	329	1,061	250	1,690
Layer maker 0.1 ha	169	843	662	1,674
Sowing field 0.2 ha	329	2,331	0	2,660
Total Costs V2	1,684	8,234	1,345	11,263

Source:Own calculations.

Costs structure for V2 variant consists of 60.04 % materials, 27.72 % labour, 3.21 % thirds, 1.05 % energy and water.

The comparative analysis of the costs related to V1 and V2 has shown that V2 is by Euro 2,256 less costing.

In the microplantation 0.5 ha, mulberry leaves are obtained starting from the 2nd year 1.1 tons,

then in the 3rd year 3.85 tons, in the 4th year 5 tons, in the 5th year 5 tons, of which 3.65 tons for silk worm feeding and 1.35 tons for sale to Plafar. The amount of leaves sold to Plafar exceeds the need for silk worm rearing, contributing to higher income.

In the micro-plantation 0.5 ha, investment cost is Euro 4,856 of which Euro 857 for soil tillage

and Euro 3,999 Euro for plantation for Euro 433.
 establishment and maintenance cost accounts

Table 3. Financial results in microplantation 0.5 ha

Year	Income (Euro)	Costs (Euro)	Financial results (Euro)
I Soil Tillage + Setting up	0	857 + 3,999= 4,856	-4,856
II Maintenance	0	433	-433
III	146.30	433	-286.70
IV	521.05	433	+88.05
V	575.90	433	+142.90
VI	575.90	433	+142.90
VII	691.08	433	+258.08
VIII	864.18	433	+431.18
IX	864.18	433	+431.18
X	864.18	433	+431.18
XI	864.18	433	+431.18
XII	864.18	433	+431.18
XIII	864.18	433	+431.18
XIV	864.18	433	+431.18
XV	864.18	433	+431.18
XVI	864.18	433	+431.18
XVII	864.18	433	+431.18
XVIII	864.18	433	+431.18
XIX	864.18	433	+431.18
TOTAL	12,880.39	12,650	+230.39

Own calculations. Note: Inflation rate was not taken into account.

Taking into account that in the 1st and 2nd years there is no income, and starting from the 3rd year, the production of leaves will reach 2.2 t/ha up to 15 t/ha in the 8th year, and then it remains constant, the mulberry plantation will become profitable after 9 years, when income will reach Euro 12,880.39, exceeding costs of Euro 12,650, and leading to Euro 230.39/0.5 ha or Euro 460.78/ha profit, under 1.82 % profit rate (Table 3).

Layers production of 5,000 pieces/0.5 ha (10,000 pieces/ha) will be obtained in the 2nd

year. Sale price is Euro 1.03 /layer. Production will remain constant in the coming years and income will account for Euro 5,150/year.

In case of layer maker 0.5 ha, investments costs will account for Euro 4,958 of which Euro 857 tillage and Euro 4,101 setting up, and maintenance Euro 3,272. Starting from the 2nd year, a number of 5,000 layers are obtained from 0.5 ha, which could be sold at Euro 1.03/piece resulting Euro 5,150 income/year (Table 4).

Table 4. Financial results in Layer maker 0.5 ha

Year	Income (Euro)	Costs (Euro)	Financial results (Euro)
I Tillage and Establishment	0	857 + 4,101 = 4,958	-4,958
II Maintenance	5,150	3,272	+1,878
III	5,150	3,272	+1,878
IV	5,150	3,272	+1,878
TOTAL	15,450	9,816	+676
Profit rate (%)	-	-	6.88

Investment and maintenance cost in layer maker are covered in the 4th year, when the sericulturist will get Euro 676 profit under 6.88 % profit rate. Beginning from the 2nd

year, income will be Euro 5,150 covering maintenance cost Euro 3,272 and leading to Euro 1,878 profit and 57.39 % profit rate.

For V1, investment cost of Euro 9,814 per 1 ha, of which 0.5 plantation for leaves and 0.5 ha layer maker are covered in the first 8 years, assuring Euro 3,675.41 profit and 44.88 %profit rate (Table 5).

In the established plantation, Mulberry seed will be obtained in the 4th year, 6 kg/0.2 ha,

which estimated at Euro 267/kg market price, means Euro 1,600 income. Seed production increase by 1 kg every year, reaching maximum 10 kg in the 8th year and then it remains constant. Therefore, after the 8th year, income coming from seed are constant and equal to Euro 2,670/0.2 ha or Euro 13,350/ha.

Table 5. Financial results per 1 ha, V1=Mulberry tree plantation 0.5 ha and Layer maker 0.5 ha (Euro)

Year	Plantation 0.5 ha	Layer maker 0.5 ha	Total V1
I	-4,856	-4,958	-9,814
II	-433	+1,878	+1,445
III	-286.70	+1,878	+1,591.30
IV	+88.05	+1,878	+1,966.05
V	+142.90	+1,878	+2,020.90
VI	+142.90	+1,878	+2,020.90
VII	+258.08	+1,878	+2,136.08
VIII	+431.18	+1,878	+2,309.18
TOTAL	-4,512.59	+8,188	+3,675.41

Source:Own calculations.

In seed field 0.2 ha, in the first 3 years there is no profit. Only in the 4th year when 6 kg seeds are obtained from 0.2 ha, a profit of Euro 1,350/0,2 ha and a profit rate of 540 % could be assured. Maximum profit rate is

966.80 % in the 8th year, when seed production will be 10 kg/0.2 ha. In the next years, profit rate will remain constant (Table 6).

Table 6.Financial results in Seed Field 0.2 ha

Year	Income (Euro)	Costs (Euro)	Financial results (Euro)
I Tillage + Setting up	0	329+ 1,061 = 1,390	-1,390
II Maintenance	0	250	-250
III	0	250	-250
IV	1,600	250	+1,350
V	1,867	250	+1,617
VI	2,133	250	+1,883
VII	2,400	250	+2,150
VIII	2,667	250	+2,417

Source: Own calculations.

In layer maker 0.1 ha, production will be obtained in the 2nd year and will remain constant for 1,000 kg leaves in the coming years and income will account for Euro 1,030/year.

In the 4th year, all the costs of Euro 2,993 are covered by Euro 3,090 income and Euro

97profit/0.1 ha and 3.53 % profit rate will result during the 4 years. Taking into account only income and maintenance costs, the annual profit is Euro 368/0.1 ha starting from the 2nd year and profit rate will account for 56,06 % (Table 7).

Table 7.Financial results in layer maker 0.1 ha

	Income (Euro)	Costs (Euro)	Financial results (Euro)
I Tillage + Setting up	0	164 + 843 = 1,007	-1,007
II Maintenance	1,030	662	+368
III	1,030	662	+368
IV	1,030	662	+368
TOTAL	3,090	2,993	+97

Source: Own calculations.

From sowing field 0.2 ha, a number of 33,200 saplings/0.2 ha (166,000 plants/ha) will be obtained, of which in autumn about 40 %, that is 13,280 saplings could be sold and the remaining of 60 %, that is 19,920 saplings will be grown and sold in the 2nd year.

In autumn, land is tilled and in the next year it is sown, so that in the 2nd year about 33,200

saplings could be obtained of which 40 % are sold in the 2nd year and the remaining of 60 % will be grown and sold in the 3rd year.

This cycle is repeated every two years, income increasing from Euro 6,906 in the 1st year to Euro 10,358 in the 2nd year, if all the other items remain constant.

Table 8. Financial results Sowing field 0.2 ha

	Income (Euro)	Costs (Euro)	Financial results(Euro)
I Tillage + Setting up	6,861	329 + 2,331 = 2,660	+4,201
II Tillage + Setting up	10,292	2,660	+7,632
III Tillage + Setting up	6,861	2,660	+4,201
IV Tillage + Setting up	10,292	2,660	+7,632

Source: Own calculations.

Therefore, in Sowing field 0.2 ha, profit is achieved every year. In the 1st year, profit will account for Euro 4,201/0.2 ha, and profit

rate for 157,94 %, in the 2nd year, profit will account for Euro 7,632/0.2 ha, and profit rate will reach 286.92 % (Table 9).

Table 9. Financial results for V2 Total (Euro)

Year	Mulberry plantation 0.5 ha	Seed field 0.2 ha	Layer maker 0.1 ha	Sowing field 0.2 ha	Total
I	-4,856	-1,390	-1,007	+4,201	-3,052
II	-433	-250	+368	+7,632	+7,317
III	-286.70	-250	+368	+4,201	+4,032.30
IV	+88.05	+1,350	+368	+7,632	+9,438.05
V	+142.90	+1,617	+368	+4,201	+6,328.90
VI	+142.90	+1,883	+368	+7,632	+10,025.90
VII	+258.08	+2,150	+368	+4,201	+6,977.08
VIII	+431.18	+7,250.19	+1,113.70	+22,896.12	+10,848.26
TOTAL	-4,512.51	+7,527	+1,569	+47,332	+51,915.49

Source: Own calculations

Table 10. Comparison between financial results by experimental variant (Euro)

Year	V1	V2	V2-V1
I	-9,814	-3,052	+6,762
II	+1,445.00	+7,317	+5,872
III	+1,591.30	+4,032.30	+2,441
IV	+1,966.05	+9,438.05	+7,472
V	+2,020.90	+6,328.90	+4,308
VI	+2,020.90	+10,025.90	+8,005
VII	+2,136.08	+6,977.08	+4,841
VIII	+2,309.18	+10,848.26	+8,539.08
TOTAL	+3,675.41	+51,915.49	+48,240.08

Source: Own calculations

In case of V2 variant, in the 1st year, it will be a loss of Euro 3,052/ha, but starting from the 8th year it will be obtained Euro 10,848. This will be possible because the loss coming from production of leaves in microplantation will be covered by profit in seed field 0.2 ha

starting from the 3rd year, by the profit got in layer maker 0.1 ha starting from the 2nd year and profit achieved in sowing field 0.2 ha starting from the 1st year (Table 10).

CONCLUSIONS

Taking into consideration the minimum total costs, the order of the variants is V2 and V1. Based on cumulated financial results during 8 years of activity, the order of the variants is also V2 and V1. The V2 variant assures Euro 51,915.49 profit, while V1 just Euro 3,675.41 profit. Therefore, the most profitable variant is V2. This means that production diversification in mulberry tree growing has had positive effects leading to an increased profitability.

The hierarchy of the variants was made based on profit that the sericulturist could get in the first 8 years of activity when mulberry plantation will reach the maximum production.

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REFERENCES

- [1]Al-kirshi R.A., Alimon A.R., Zulkifli I., Zahari M.W., Sazili A.Q., 2009, The Chemical Composition and Nutritive Value of Mulberry Leaf as a Protein Source in Poultry Diets, The 1st International Seminar on Animal Industry, Faculty of Animal Science, Bogor Agricultural University, p.98
- [2]Baiski D., 2009, Candva in floritoare, sericultura romaneasca se afla in agonie, www.dusanbaiski.eu, 28,dec,2009
- [3]Datta R.K., Sarkar A., Rama Mohan Rao P., Singhvi N.R.,2012, Utilization of mulberry as animal fodder in India, www.fao.org
- [4]Jayab M.M., Kehar N.D., 1962, a Study on the nutritive value of Mulberry tree leaves, India J.Dairy Sci., 15(1):21-27, www.fao.org
- [5]Liu J.X., Yao J., Yan B.J., Shi Z.Q., Wang X.Q., 2012, Mulberry leaf supplement for sheep fed ammoniated rice straw.China, www.fao.org
- [6]Matei, Alexandra, 2004, Cresterea viermilor de matase, Ed.Alex-Leti Press
- [7]Miller D., McDonald D., Asiedu F., 2012, The Effect of Mulberry Leaf Meal on the Growth Performance of Weaner Goats in Jamaica
- [8]Mondal K, Kaviraj A., Mukhopadhyar P.K., 2012, Effects of partial replacement of fishmeal in the diet by mulberry leaf meal on growth performance and digestive enzyme activities of Indian minor carp Labeo bata, International Journal of Aquatic Science, Vol.3(1), 2012:72-83
- [9]Olteanu M., Panaite T., Curescu G., Criste R.D., 2010, Effect of dietary Mulberry Leaves on Nutrient Digestibility and Layer Performance, XIIIth European Poultry Conference, Tours, France, 23-27 august 2010
- [10]Tanase D., 2009, Monography-Mulberry tree growing in Romania.Moricultura-a source of new commercial products. Eastfalia Press House, Bucharest.
- [11]Project CEEEX 40/10.10.2005, "SERI" Management of family sericultural reproduction farm under integrated production, 2005-2010

AGRO-FOOD TRADE POSITION IN ROMANIA'S FOREIGN TRADE

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Abstract

The purpose of the paper was the analysis of the agro-food foreign trade position in Romania's foreign trade in the period 2005-2010. Agro-food foreign trade registered a fast dynamics, its volume accounting for Euro Million 7,053 in 2010, being by 161 % higher than in 2005. Its share in Romania's foreign trade increased from 3.02 % in 2005 to 8.36 % in 2010. Vegetal products are the best exported goods (52.41 %), followed by food products, beverages and tobacco (28.46 %). Romania's import is mainly dominated by food products, beverages and tobacco (40.34 %) and vegetal products (29.06 %). The EU countries are the main trade partners, accounting for about 80 % both in the export and import value. In 2010, agro-food export accounted for 8.54 % and agro-food import for 9.42 % in Romania's trade with the EU. Romania's agro-food products are mainly exported in Italy, Bulgaria, Hungary, the Netherlands, Spain and Germany and imports come especially from Hungary, Germany, Bulgaria, the Netherlands, Poland and Italy. The agro-food trade has become a more and more efficient part of Romania's trade taking into consideration the export share in GDP, import coverage by export and export per inhabitant.

Key words: agro-food trade, efficiency, foreign trade, Romania, trade partners

INTRODUCTION

The development of agriculture depends on the position of agricultural products of a country in the international market. For this reason, Romania has paid a special attention to agricultural production, to the quality of agricultural products in order to become a more competitive exporter [1].

The last decades have shown an intensified trade especially with the EU countries, especially after Romania's entry into the Common Market [3]. As a result, the role of agro-food trade has become more and more important in the development of the economy and in the assurance of consumer's needs. The open frontiers allowed the penetration of various agro-food products completing the domestic production in the market eliminating the offer seasonality.

The alignment to the EU commercial agreements has open a new gate to the international market for Romania [5].

However, import has been the most dynamic feature of Romania's agro-food trade compared to export, so that the deficit of the

trade balance has become more and more accentuated [2, 4].

In this context, the goal of the paper was to present the evolution of the main indicators characterizing Romania's agro-food trade and to establish its contribution to the development of foreign trade, identifying the main trends and evaluating its efficiency in the period 2005-2010.

MATERIALS AND METHODS

The data were provided by the National Institute for Statistics for Romania's foreign trade and agro-food trade and refer to the period 2005-2010 [6].

The methodology used in order to process the data was represented mainly by the index, share and comparison methods.

The following indicators were used to characterize agro-food foreign trade: export, import, trade balance, agro-food trade share in the country's foreign trade, agro-food trade by product group, trade partners.

In order to evaluate agro-food trade efficiency the following specific ratios were utilized:

export/GDP, import/GDP, export/import, export/agricultural production and export/inhabitant.

RESULTS AND DISCUSSIONS

Contribution of agriculture, hunting and fishing to GDP. In the period 2005-2010, Romania's GDP increased by 54 % from Euro Million 79,200 in 2005 to Euro Million

122,000 in 2010. The GDP created in the field of agriculture, hunting and fishing had registered a lower increase of only 11.35 % from Euro Million 6,700.3 in 2005 to Euro Million 7,461.1 in the year 2010. Because of the slow dynamics, the share of GDP created in agriculture, hunting and fishing declined from 9.40 % in 2005 to 6.01 % in 2010 (Table 1).

Table 1. GDP in agriculture, hunting and fishing, Romania, 2005-2010 (Euro Million)

	2005	2006	2007	2008	2009	2010	2010/2005 %
GDP	79,200	97,100	121,200	136,800	115,900	122,000	154,040
GDP (Euro/capita)	3,688	4,530	5,788	6,499	5,508	5,792	157.05
GDP in agriculture, hunting and fishing	6,700.3	7,616.9	7,181.3	9,266.6	7,622.2	7,461.1	111.35
Share of GDP in agriculture, hunting and fishing inGDP (%)	8.40	7.78	5.76	6.64	6.44	6.01	-

Source:Romania's Statistical Yearbook,2011. Own calculations.

Romania's agricultural production.

Agricultural production has been continuously developing during the analyzed period. Its value increasing by 19.20 % from Euro Million 12,844 in 2005 to Euro Million 15,310 in 2010. The vegetal production is the most dynamic sector in agriculture. In 2010, the production value created in this sector accounted for Euro Million 10,334, being by 33.87 % higher than in 2005. The animal production registered a continuous decline as its value accounted for Euro Million 4,838 in 2010, being by 3.67 % lower than in the year 2005. As a consequence, the weight of vegetal production value increased from 60.1 % in 2005 to 67.5 % in 2010, while the share of animal production decreased from 39.1 % in 2005 to 31.6 % in 2010 in agricultural production value (Table 2).

Romania's foreign trade has recorded a continuous development in the analyzed period. Export increased by 67.90 % from Euro Million 22,256 in 2005 to Euro Million 37,368 in 2010, while import grew up by 44.02 % from Euro Million 32,568 in 2005 to Euro Million 46,902 in 2010. Therefore, import value was higher than export value. As

a result, the trade balance was a negative one registering a higher and higher deficit from 2005 to 2008 and then its figure was lower and lower. Thus, in 2010, the deficit of Romania's trade balance accounted for Euro Million 9,534, being by 7.55 % lower than in 2005 (Table 3).

Geographical orientation of Romania's foreign trade. Romania has close commercial relationships with various countries on different continents, but the main trade partner is the EU, whose share was about 72 % both for export and import in the year 2010. In 2012, the EU countries accounted for about 80 % of Romania's trade. On the second position are coming other European countries with about 14.4 % for export and 10.5 % for import. Of a less importance are the EFTA states with 1.5 % for export and 1.1 % for import. On the 3rd position, there were different countries from Asia, Americas and Oceania, their share all together representing 12 % for export and 15.9 % for import in 2010 (Table 4).

In 2010, the main trade partners were Germany, Italy, Turkey, France and Hungary (Tabel 5).

In 2010, the EU had a positive trade balance accounting for Euro Million 9,150, because export accounted for Euro Million 30,646 and import for 351,496. Romania's trade with the

EU had a negative balance represented by Euro Million 7,040, as import value (Euro Million 33,992) exceeds export value (Euro Million 26,952).

Table 2. Romania's agricultural production (Euro Million)

	2005	2006	2007	2008	2009	2010	2010/2005 %
Agricultural production	12,844	14,371	14,293	18,192	14,143	15,310	119.20
-Vegetal sector	7,719	8,896	8,604	12,425	8,429	10,334	133.87
-Animal sector	5,022	5,346	5,474	5,567	5,530	4,838	96.33
-Services	103	129	215	200	184	138	133.98
Share of agricultural production by sector (%)	100	100	100	100	100	100	100
-Vegetal sector	60.1	61.9	60.2	68.3	59.6	67.5	-
-Animal sector	39.1	37.2	38.3	30.6	39.1	31.6	-
-Services	0.8	0.9	1.5	1.1	1.3	0.8	-

Source: Romania's Statistical Yearbook, 2011. Own calculations.

Table 3. Foreign trade, Romania, 2005-2010 (Euro Million)

	2005	2006	2007	2008	2009	2010	2010/2005 %
Export	22,256	25,850	29,549	33,725	29,084	37,368	167.90
Import	32,568	40,746	51,322	57,240	38,953	46,902	144.02
Trade balance	-10,312	-14,896	-21,773	-23,515	-9,869	-9,534	92.45

Source: Romania's Statistical Yearbook, 2011. Own calculations.

Table 4. Romania's foreign trade by main country group (%)

Country group	Export partners		Import partners	
	2007	2010	2007	2010
European Union	72.0	72.1	71.3	72.5
Other European countries	11.9	14.4	13.7	10.5
EFTA(AELS)	14.3	1.5	14.1	1.1
Other countries	1.8	12.0	0.9	15.9

Source. Own calculations.

Table 5. Romania's foreign trade by main partners (%)

Partner country	Export partners		Import partners	
	2007	2010	2007	2010
Germany	17.0	18.1	17.2.3	16.7
Italy	17.0	13.8	12.7	11.6
Turkey	8.00	7.0	7.0	7.0
France	7.7	8.3	6.3	5.9
Hungary	5.7	4.7	6.9	8.6

Source. Own calculations.

Romania's agro-food trade had been continuously developing in the analyzed period. However, import was a very dynamic

trade branch registering 94.16 % gain in 2010 compared to 2005. Thus, in 2010, import value was Euro Million 3,926 compared to Euro Million 2,022. Export value was lower

accounting for Euro Million 3,127 in 2010, when it was 4.64 times higher than in 2005. Therefore, export was the most dynamic part of Romania's trade. Taking into account the both parts of the trade, the commerce volume

increased by 161.70 % in the analyzed period, its value accounting for Euro Million 7,053 in 2010 in comparison with Euro Million 2,695 in the year 2005(Table 6).

Table 6. Agro-food export, import and trade balance, Romania, 2005-2010 (Euro Million).

	2005	2006	2007	2008	2009	2010	2010/2005 %
Export	673	854	1,122	2,165	2,243	3,127	464.63
Import	2,022	2,425	3,339	4,346	3,823	3,926	194.16
Balance	-1,349	-1,571	-2,217	-2,181	-1,580	-799	59.22
Trade value	2,695	3,279	4,461	6,511	6,066	7,053	261.70

Source: Romania's Statistical Yearbook, 2011. Own calculations.

Weight of agro-food trade in foreign trade.

Taking into consideration the figures registered by export and import with agro-food products and the the export and import value of Romania, one can easily notice that

the share of agro-food trade has increased in the period 2005-2010. In 2010. Agro-food export represented 8.36 % in Romania's export value, while, agro-food import accounted for 8.37% (Table 7).

Table 7. Weight of agro-food trade in foreign trade, Romania, 2005-2010 (%)

	2005	2006	2007	2008	2009	2010
Foreign trade	100	100	100	100	100	100
Agro-food export	3.02	3.30	3.79	6.41	7.71	8.36
Agro-food import	6.20	5.95	6.50	7.59	9.81	8.37
Agro-food balance	13.08	10.54	10.18	9.27	16.00	8.38

Source: Own calculations.

Romania's agro-food trade with the EU.

Taking into consideration the close relationship existing between Romania and the EU which has been strengthened after the country entry into the Common Market, the agro-food trade has been intensified so that in the year 2010, it reached 8.54 % of total

export and 9.42 % of total import. In 2010. Romania's agro-food export value accounted for Euro thousand 2,303,071 while import value was Euro thousand 3,203,856. As a consequence, trade balance registered Euro thousand 900,785 deficit (Table 8).

Table 8. Romania trade and agro-food trade with the EU, 2010 (Euro thousand)

Specification	Value (Euro thousand)	Share (%)
Romania's Export value	26,952,867	100
Agro-food export value	2,303,071	8.54
Romania's Import value	33,992,062	100
Agro-food import value	3,203,856	9.42
Romania's Trade Balance	-7,039,195	100
Agro-food trade balance	-900,785	12.79 %

Source: Romania's Statistical Yearbook, 2011. Own calculations.

The main EU partners in Romania's agro-food trade are: Italy, Bulgaria, Hungary, the Netherlands, Spain and Germany for export and Hungary, Germany, Bulgaria, the Netherlands, Poland and Italy for import (Table 9).

Trade by agro-food product group. The main agro-food product groups both for export and import are: Live animals and products, Vegetal products, Vegetal and animal fats and oils and Food products, beverages, tobacco according to the statistical classification. The figures showed that in the

period 2005-2010, all the agro-food product groups registered an important growth. Regarding export of agro-food products, live animals were on the top position, followed by vegetal and animal fats and oils, and then by food products, beverages and tobacco and on the last position there were situated vegetal

products. Regarding import, the highest value belonged to food products, beverages and tobacco, followed on the second position by vegetal products, on the third position by live animals and on the last one by vegetal and animal fats and oils (Table 10.)

Table 9. Agro-food trade by main EU country partner, Romania, 2010

Export value with the EU= Euro Thou. 2,303,071			Import value with the EU=Euro Thou. 3,203,856		
Country	Export Euro thousand	Share %	Country	Import Euro thousand	Share %
1.Italy	545,067	23.66	1.Hungary	691,162	21.57
2.Bulgaria	301,249	13.08	2.Germany	493,029	15.39
3.Hungary	250,343	10.86	3.Bulgaria	450,130	14.04
4.Netherlands	198,373	8.62	4.Netherlands	272,660	8.51
5.Spain	191,373	8.31	5.Poland	241,881	7.55
6.Germany	178,426	7.74	6.Italy	230,012	7.17
Total	1,664,831	72.27	Total	2,378,874	74.23

Source: Romania's Statistical Yearbook, 2011. Own calculations.

Table 10. Romania 's trade by agro-food product group, 2005-2010 (Euro Million)

	2005	2006	2007	2008	2009	2010	2010/2005 %
EXPORT	673	854	1,122	2,165	2,243	3,127	464.63
I.Live animals and products	196	211	252	278	326	434	221.42
II.Vegetal products	276	407	440	1,198	1,126	1,639	593.84
III.Vegetal and animal fats and oils	62	57	68	106	88	164	264.51
IV.Food products, beverages, tobacco	139	179	362	583	704	890	640.28
IMPORT	2,022	2,425	3,339	4,346	3,823	3,926	194.16
I.Live animals and products	662	707	870	1,191	1,116	984	148.62
II.Vegetal products	437	583	1,037	1,259	1,003	1,141	261.09
III.Vegetal and animal fats and oils	59	74	144	227	160	217	367.79
IV.Food products, beverages, tobacco	864	1,106	1,288	1,669	1,544	1,584	183.33

Source: Romania's Statistical Yearbook, 2011; Own calculations.

In the first year of the analysis, 2005, the weight of each product group in the agro-food export was: 41 % vegetal products (fruits, vegetables and cereals), 29.12 % live animals and products of animal origin, 20.65 % food products, beverages and tobacco and 9.23 % fats and oils pf vegetal and animal origin.

In 2010, the situation was the following one: vegetal products 52.41 %, food products, beverages and tobacco 28.46 %, live animals and products of animal origin 13.88 % and fats and oils of animal and vegetal origin 5.25 %.

The growth rate by product group in 2010 in comparison with the level registered in the year 2005 was the following one: 540 % for food products, beverages and tobacco, 493 %

for vegetal products, 164 % for vegetal and animal fats and oils and 121 % for live animals and products of animal origin.

Efficiency of Romania'a agro-food trade has been continuously increasing in the analyzed period.

The arguments are the following ones: in 2010 compared to 2005, the trade balance diminished its deficit by 40 %, the export/GDP increased 4 times, export/agricultural production increased 3.9 times export/import ratio grow up 2.3 times and export value/inabitant increased 4.6 times. However, import/GDP increased 1.74 times which is was not a positive aspect (Table 11).

Table 11. Efficiency of Romania's agro-food- trade , 2005-2010

Indicator	MU	2005	2010	2010/2005 %
GDP	Euro Billion	6.7	7.5	111.9
Trade balance	Euro Billion	-1.3	-0.8	61.5
Impact of trade balance on GDP	%	-19.4	-10.7	55.1
Export share in GDP (E/GDP)	%	10.0	41.9	419.0
Import share in GDP (I/GDP)	%	30.2	52.6	174.1
Export share in agricultural production value	%	5.2	20.4	392.6
Import coverage by export (E/I)	%	33.28	79.65	239.33
Export/inhabitant	Euro/capita	31.1	145.9	469.1

Source: Own calculations

CONCLUSIONS

Romania has a more intensive foreign trade and especially with agro-food products. Both export and import value increased, but the most dynamic sector of Romania's trade is import as long as the domestic production can not cover consumer's needs in all the seasons. Agro-food trade reached Euro Million 7,053 in 2010, being by 161 % higher than in 2005. Its weight in Romania succeeded to assure a better coverage of the domestic and external market with agro-food products grace to the increase of its foreign trade from 3.02 % in 2005 to 8.36 % in 2010.

Export of agro-food products had the following structure in 2010: vegetal products 52.41 %, food products, beverages and tobacco 28.46 %, while import consisted mainly of food products, beverages and tobacco 40.34 % and vegetal products 29.06 %.

In 2010, the trade with the EU countries accounted for about 72 % in Romania's trade and the agro-food export was represented by 8.54 % while agro-food import for 9.42 %.

Italy, Bulgaria, Hungary, Netherlands, Spain and Germany were the main Romania's EU partners for agro-food export while the main partners agro-food products were imported

were Hungary, Germany, Bulgaria, Netherlands, Poland and Italy.

Romania's agro-food trade has become a more and more efficient economic branch because the higher level of export value per GDP and inhabitant, a more effective export/import ratio and a lower deficit of trade balance.

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REFERENCES

- [1] Anghelache, C., 1999, Foreign trade-Finance and financial-banking analysis, Economical Press House, Bucharest,
- [2] Fruja, I., Milin, Anda, Radac Andreea Mihaela, Merce Iuliana, 2010, Foreign trade in agricultural products of Romania, Scientific Papers, Agricultural Management, Series I, Vol. XII(2), 2010, p.403-408
- [3] Popescu Agatha, 2010, Home and Foreign Trade, Dominor Publishing House, Bucharest, p.270-296
- [4] Popescu Agatha, Study concerning Romania's agro-food foreign trade, 2011, Scientific Papers Agricultural Management, Series I, Vol. XIII, Issue 1, p.99-106
- [5] Zahiu Letitia, Tome Elena, Dachin Anca, Alexandri Cecilia, 2010, Agriculture in Romania's Economy, p.26-30, CERES Publishing House, Bucharest
- [6] Romania's Statistical YearBook, 2011

CONSIDERATIONS ON ROMANIA'S AGRO-FOOD EXPORT AND IMPORT BY EUROPEAN UNION COUNTRY GROUP AND AGRO-FOOD PRODUCT GROUP

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Abstract

The goal of the paper was the analysis of Romania's the agro-food export, import and trade balance by the EU country group and agro-food product group based on the statistical data in the year 2010 in order to identify the commercial relationships with a positive and respectively a negative impact of the trade balance. The EU trade partners were divided into 4 groups: Central Eastern (CE), Western (W), Northern (N) and Southern (S) EU countries and the agro-food product groups were: Live animals and preparations of animal origin, Vegetal products, Fats and oils of vegetal and animal origin, Food, beverages and tobacco. The data were processed using the share and comparison methods. In 2010, Romania registered a negative agro-food trade balance with a deficit of Euro thousand 903,148. This was due to the unefficient commerce with the CE and W EU countries, which together recorded Euro Thousand 1,400,298 deficit. The balance was positively influenced by the Southern EU trade partners whose contribution accounted for Euro thousand 513,953. Therefore, the agro-food trade has to be intensified with the Southern EU countries and to become more relaxed with the CE and W EU countries, especially regarding imports. Live animals are mainly required in the CE and W EU countries, vegetal products in the W and S EU countries, fats and oils in the CE and S EU countries, and finally, food, beverages and tobacco in the S and the CE EU countries. Agro-food imports have to be substantially diminished as long as Romania's agriculture is able to produce for the internal market and export has to be intensified especially with the countries with a positive impact on the trade balance.

Key words: agro-food product group, export, import, EU country group, Romania, trade balance

INTRODUCTION

The entrance of Romania into the EU structure has had both a positive and a negative impact on the agro-food trade.

The positive impact was the opening of the frontiers for a free trade between the EU member states and the common market, and a better cover of the domestic demand by a larger variety of the agro-food offer [1].

The negative impact was caused by the invasion of foreign agro-food products sometimes at lower prices in the domestic market. As these products came from countries with a better subsidized agriculture than in Romania, local producers have been deeply affected. Also, Romanian agro-food products are not so competitive in the EU market, except vegetal products (cereals, vegetables, fruits) and food, beverages,

tobacco which affected the export volume and price. As a consequence, agro-food trade balance was a negative one [2, 4].

The fact that the share of the EU in Romania's agro-food trade in the highest one accounting for about 80 % both regarding export and import, it is imposed to analyze the commercial relationships with the EU member states in order to identify which partner contributes to a positive trade balance and which partner involves a negative trade balance [3].

In this context, the goal of the paper was to analyze the situation of agro-food trade by EU country group based on the geographical position (Central Eastern, Western, Northern and Southern states) and also on the agro-food product group according to the statistical classification in force in Romania: live animals, vegetal products, fats and oils of

vegetal and animal origin, food, beverages and tobacco. The final purpose was to evaluate the impact of each EU trade partner on Romania's agro-food trade balance in order to recommend the decision makers the development of the agro-food commerce with the those countries whose impact is a positive one.

MATERIALS AND METHODS

The data were collected from the National Institute for Statistics for the year 2010 [5] and were processed using the share and comparison methods.

The EU countries were divided into 4 groups: Central and Eastern E.U. countries (CE EU), Western EU countries (W EU), Northern EU countries (N EU) and Southern EU countries (S EU).

The agro-food products were divided into 4 classes according to the statistical classification: (1) Live animals and preparations of animal origin, (2) Vegetal products, (3) Fats and oils of vegetal and animal origin and (4) Food, beverages and tobacco.

The following indicators were analyzed by each EU country group and agro-food product group: export value, import value, trade balance. Also, the trade balance was

calculated by EU country in order to identify the origin of the deficit by trade partner.

RESULTS AND DISCUSSIONS

Distribution of Romania's export and import value by EU country group.

In 2010, Romania's export with the EU countries accounted for Euro thousand 26,952,926, while its export recorded Euro thousand 33,985,745, resulting a negative trade balance of Euro thousand -7,032,819.

Romania's export was destined mainly to the W EU countries whose share was 48.89 %, on the 2nd position coming the S EU countries with 26.49 %, on the 3rd position the CE EU countries with 22.91 % and on the last position the N EU countries (1.71 %).

Romania's import was run especially with the W EU countries whose weight represented 43.73 %, then with the CE EU countries with a share of 33.27 %, on the 3rd position came the S EU countries with 21.50 % and finally the N EU countries with the smallest share 1.50 %.

As a result, the trade balance was a negative one for all the EU country groups, the highest share in the deficit was 72.98 % determined by the trade with the CE and the W EU countries (Table 1).

Table 1. Distribution of Romania's export and import value by EU country group, 2010

Country Group	Export value (Euro thousand)	Share (%)	Import value (Euro thousand)	Share (%)	Trade balance (Euro thousand)	Share %
CE EU	6,175,543	22.91	11,308,264	33.27	-5,132,726	72.98
W EU	13,179,219	48.89	14,862,172	43.73	-1,682,953	23.92
N EU	461,549	1.71	508,593	1.50	-47,044	0.67
S EU	7,136,615	26.49	7,306,716	21.50	-170,101	2.43
Total trade with the EU-27	26,952,926	100.00	33,985,745	100.00	-7,032,819	100.00

Source: National Institute for Statistics, 2012; Own calculations.

Distribution of Romania's agro-food export and import value by EU country group.

The distribution of Romania's agro-food export value was the following one: 41.27 % with the S EU countries, 30.39 % with the CE EU countries, 27.78 % with the W EU

countries and 0.56 % with the N EU countries.

The agro-food import value was distributed among the EU country groups as follows: 51.41 % the CE EU countries, 34.04 % the W EU countries, 13.68 % the S EU countries and 0.93 % the N EU countries.

As a result, the agro-food trade balance was a negative one in case of the CE, W and N EU countries, but a positive one in case of the S

EU countries. The highest deficit was caused by the trade relations with the CE and W EU countries (Table 2).

Table 2. Distribution of Romania's agro-food export and import value by EU country group, 2010

Country Group	Agro-food export value (Euro thousand)	Share (%)	Agro-food import value (Euro thousand)	Share (%)	Agro-food Trade balance (Euro thousand)
CE EU	700,037	30.39	1,648,613	51.41	-948,576
W EU	639,921	27.78	1,091,643	34.04	-451,722
N EU	13,055	0.56	29,858	0.93	-16,803
S EU	950,044	41.27	436,091	13.68	-513,953
Total trade with the EU-27	2,303,057	100.00	3,206,205	100.00	-903,148

Source: National Institute for Statistics, 2012; Own calculations.

The weight of agro-food trade in Romania's trade with the EU country groups.

In 2010, agro-food export represented 8.54 % of Romania's export value while agro-food import accounted for 9.42 % of the import value in the trade relations with the EU-27.

Regarding export, the highest share of the agro-food trade was kept by the S EU (13.31 %) and the CE EU (11.33 %) while in case of import, the highest share belonged to the CE EU (14.57 %) and the W EU (7.34 %) as shown in Table 3.

Table 3. The share of Romania's agro-food export and import value in the country's export and import value by EU country group, 2010 (%)

Country group	CE EU	W EU	N EU	S EU	Total
Share of Export	11.33	4.85	2.82	13.31	8.54
Share of Import	14.57	7.34	5.87	5.96	9.42

Source: Own calculations.

Export value by agro-food product group and EU country group.

Analyzing the situation of export value by agro-food product group and the EU country group, one can notice the following aspects:

-Live animals and preparations of animal origin were mainly exported in the CE EU

(41.43 %), in the S EU (35.02 %) and in the W EU (23.19 %).

-Vegetal products were especially exported in the W EU (42.46 %), but also in the S EU (39.79 %), followed by the CE EU (17.64 %).

Table 4. Export value by agro-food product group and EU country group, 2010

Product group	MU	CE EU	W EU	N EU	S EU	Total
Live animals and preparations	Euro thousand	140,594	78,706	1,244	118,758	339,302
	%	41.43	23.19	0.36	35.02	100.00
Vegetal products	Euro thousand	179,871	432,828	915	405,651	1,019,265
	%	17.64	42.46	0.11	39.79	100.00
Fats and oils of vegetal and animal origin	Euro thousand	100,150	9,426	-	49,640	159,216
	%	62.90	5.92	-	31.18	100.00
Food, beverages and tobacco	Euro thousand	279,422	118,961	10,896	375,995	785,274
	%	35.58	15.14	1.38	47.90	100.00
Total	Euro thousand	700,037	639,921	13,055	950,044	2,303,057
	%	100.00	100.00	100.00	100.00	-

Source: National Institute for Statistics, 2012; Own calculations.

-Fats and oils of vegetal and animal origin were exported, mainly in the CE EU (62.90

%) and also in the S EU (31.18 %) and just a few percentage belonged to the W EU (5.92 %)

-Food, beverages and tobacco were exported mainly to the S EU (47.90 %), the CE EU (35.58 %) and the W EU (15.14 %) and finally to the N EU (1.38 %) as presented in Table 4.

Import value by agro-food product group and EU country group.

The import value also varied by EU country group and agro-food product group as follows:

-Live animals and preparations of animal origin were mainly imported from the W EU (44.59 %) and the CE EU (40.48 %), then

from the S EU (13.62 %) and finally from the N EU (1.31 %).

-Vegetal products were imported from the CE EU (61.23 %), the W EU (23.72 %), followed by the S EU (14.91 %) and a very small percentage for the N EU (0.14 %).

-Fats and oils were mainly imported from the CE EU (61.59 %) and the W EU (24.51 %), followed by the S EU (10 %) and the N EU (3.90 %).

-Food, beverages and tobacco were imported from the CE (55.02 %), the W EU (32.22 %), the S EU (12.05 %)(Table 5).

Table 5. Import value by agro-food product group and EU country group, 2010

Product group	MU	CE EU	W EU	N EU	S EU	Total
Live animals and preparations	Euro thousand	372,520	410,354	12,121	125,182	920,177
	%	40.48	44.59	1.31	13.62	100.00
Vegetal products	Euro thousand	557,474	216,014	1,303	135,646	910,437
	%	61.23	23.72	0.14	14.91	100.00
Fats and oils of vegetal and animal origin	Euro thousand	111,497	44,383	7,077	18,064	181,021
	%	61.59	24.51	3.90	10.00	100.00
Food, beverages and tobacco	Euro thousand	718,590	420,892	9,357	157,199	1,306,038
	%	55.02	32.22	0.71	12.05	100.00
Total	Euro thousand	1,648,613	1,091,643	29,858	436,091	3,206,205
	%	100.00	100.00	100.00	100.00	-

Source:National Institute for Statistics, 2012; Own calculations.

Agro-food trade balance by EU country group and agro-food product group.

-Live animals had a negative balance in case of all the EU country groups. The main contribution to the deficit of Euro thousand 580,875 was given by the commercial relationship with the W EU countries (57.09 %) and the CE EU countries (39.92 %).

-In case of vegetal products, the balance was a positive one, Euro thousand 108,828. This was due to the efficient trade with the S EU countries which had a positive balance of Euro thousand 279,005 and also with the W EU group, which had a positive balance of Euro thousand 216,814. The EU country group with a deep negative impact on Romania's vegetal product balance was the CE group of states.

-Fats and oils of animal and vegetal origin registered a negative balance of Euro thousand 21,755, because of the deficit created by the commercial relationships with the W EU, the CE EU and finally with the N EU. The trade with the S EU countries had a positive effect on fats and oils balance (Euro thousand 31,626).

-Food, beverages and tobacco registered a negative balance of Euro thousand 520,764. The CE EU and the W EU countries had a deep negative impact on the balance with a high deficit accounting for Euro thousand 439,168 and, respectively, Euro thousand 301,931. The trade with the S EU had a positive impact of Euro thousand 218,796 on food, beverages and tobacco balance and also the N EU had a smaller contribution of Euro thousand 1,539 (Table 6).

Table 6. Agro-food trade balance by EU country group and agro-food product (Euro thousand)

Product group	CE EU	W EU	N EU	S EU	Total
Live animals and preparations	-231,926	-331,648	-10,877	-6,424	-580,875
Vegetal products	-337,603	+216,814	-388	+270,005	+108,828
Fats and oils of vegetal and animal origin	-11,347	-34,957	-7,077	+31,626	-21,755
Food, beverages and tobacco	-439,168	-301,931	+1,539	+218,796	-520,764

Source:Own calculations.

Export value by agro-food product group for the Central Eastern EU countries

The value of the agro-food exported products in the CE EU countries accounted for Euro thousand 700, 037 of which the highest share was kept by Bulgaria (43 %) and Hungary

(36%), followed by Poland, Austria and the Czech Republic. The weight of the CE EU countries was 40 % in case of food, beverages and tobacco, 26 % in case of vegetal products, 20 % for live animals and animal preparations (Table 7).

Table 7. Export value by CE EU country and agro-food product group (Euro thousand)

Product group	Austria	Bulgaria	Czech Republic	Poland	Slovakia	Slovenia	Hungary	Total
Live animals and preparations	4,796	87,853	3,921	2,220	6,723	1,177	33,904	140,594
Vegetal products	20,201	43,216	11,685	5,043	7,799	3,461	88,466	179,871
Fats and oils of vegetal and animal origin	2,857	25,112	564	2,099	5,446	16	64,056	100,150
Food, beverages and tobacco	10,890	145,068	15,137	32,688	9,337	2,385	63,917	279,422
Total	38,744	301,249	31,307	42,050	29,305	7,039	250,343	700,037

Source:National Institute for Statistics, 2012; Own calculations.

Export value by agro-food product group for the Western EU countries.

Agro-food export value with the W EU countries accounted for Euro thousand 639,921 of which 68 % vegetal products, 19 % food, beverages and tobacco, 12 % live animals.

The agro-food export was mainly developed with Netherlands, Germany, France, followed by Belgium and United Kingdom (Table 8).

Export value by agro-food product group for the Northern EU countries.

Agro-food export value registered with the N EU countries accounted for Euro thousand 13,055 of which 83 % represented food, beverages and tobacco and 10 % live animals

and preparations of animal origin. The main exports were directed to Lithuania, Latvia, Estonia and Finland (Table 9).

Export value by agro-food product group for the Southern EU countries.

Export value with the S EU countries recorded Euro thousand 375,995 in 2010 of which 43 % was represented by vegetal products, 40 % by food, beverages and tobacco, 13 % by live animals and the remaining by fats and oils. The main export flow was directed to Italy, Spain and Greece, followed by Portugal and Cyprus (Table 10).

Import value by agro-food product group for the Central Eastern EU countries

Table 8. Export value by W EU country and agro-food product group (Euro thousand)

Product group	Belgium	Denmark	France	Germany	Ireland	Luxembourg	Netherlands	United Kingdom	Total
Live animals and preparations	7,487	541	12,366	34,294	217	200	16,018	7,583	78,706
Vegetal products	77,809	154	101,620	92,007	6,899	11	145,663	8,665	432,828
Fats and oils of vegetal and animal origin	325	8	75	3,243	1	-	4,975	799	9,426
Food, beverages and tobacco	4,773	6,019	14,654	48,882	608	295	31,925	11,805	108,961
Total	90,394	6,722	128,715	178,426	7,725	506	198,581	29,358	639,921

Source: National Institute for Statistics, 2012; Own calculations.

Table 9. Export value by N EU country and agro-food product group (Euro thousand)

Product group	Estonia	Finland	Latvia	Lithuania	Sweden	Total
Live animals and preparations	-	-	78	777	389	1,244
Vegetal products	70	366	99	374	6	915
Fats and oils of vegetal and animal origin	-	-	-	-	-	-
Food, beverages and tobacco	2,360	1,814	2,744	2,903	1,075	10,896
Total	2,430	2,180	2,921	4,054	1,470	13,055

Source: National Institute for Statistics, 2012; Own calculations.

Table 10. Export value by S EU country and agro-food product group (Euro thousand)

Product group	Cyprus	Greece	Italy	Malta	Portugal	Spain	Total
Live animals and preparations	3,603	46,703	48,626	3	50	19,773	118,758
Vegetal products	24,394	40,576	163,810	3,394	38,600	134,877	405,651
Fats and oils of vegetal and animal origin	1,666	13,112	18,463	-	1,705	14,694	49,640
Food, beverages and tobacco	2,865	35,000	314,168	515	1,418	22,029	375,995
Total	32,528	135,391	545,067	3,912	41,773	191,373	950,044

Source: National Institute for Statistics, 2012; Own calculations.

The import value with the CE EU countries accounted for Euro thousand 1,648,613 of which 44 % food, beverages and tobacco, 34

% vegetal products, 23 % live animals and the remaining fats and oils. The main partners for

import from this EU group of states were Hungary, Bulgaria and Poland (Table 11).

Import value by agro-food product group for the Western EU countries.

The import value with the W EU registered Euro thousand 1,091,643 in 2010 of which 39 % food, beverages and tobacco, 38 % live

animals, 20 % vegetal products. The main import flow of agro-food products came from Germany, Netherlands and France (Table 12).

Table 11.Import by CE EU country and agro-food product group (Euro thousand)

Product group	Austria	Bulgaria	Czech Republic	Poland	Slovakia	Slovenia	Hungary	Total
Live animals and preparations	41,468	50,545	15,106	63,461	12,401	985	188,554	372,520
Vegetal products	21,726	235,629	20,569	24,360	21,946	3,787	229,457	557,474
Fats and oils of vegetal and animal origin	2,304	22,859	1,887	5,565	237	25	78,620	111,497
Food, beverages and tobacco	57,578	141,097	43,998	148,496	20,006	1,422	194,521	718,590
Total	123,076	450,130	81,560	241,886	54,590	6,219	691,152	1,648,613

Source:National Institute for Statistics, 2012; Own calculations.

Table 12.Import value by W EU country and agro-food product group (Euro thousand)

Product group	Belgium	Denmark	France	Germany	Ireland	Luxembourg	Netherlands	United Kingdom	Total
Live animals and preparations	33,090	27,046	42,399	196,170	1,305	254	102,574	7,516	410,354
Vegetal products	18,404	3,146	30,540	73,759	122	55	87,103	2,885	216,014
Fats and oils of vegetal and animal origin	3,659	5,571	469	21,499	-	-	12,983	202	44,383
Food, beverages and tobacco	37,086	13,222	59,946	201,601	2,862	440	70,000	35,735	420,892
Total	92,239	48,985	133,354	493,029	7,289	749	272,660	46,338	1,091,643

Source:National Institute for Statistics, 2012; Own calculations.

Import value by agro-food product group for the Northern EU countries.

The import value with the N EU countries accounted for Euro thousand 29,858 in 2010.

The contribution of the agro-food products to

the import flow was the following one: 40 % live animals, 31 % food, beverages and tobacco, 24 % fats and oils. The countries which provided the main import flows were Sweden and Lithuania (Table 13).

Table 13. Import value by N EU country and agro-food product group (Euro thousand)

Product group	Estonia	Finland	Latvia	Lithuania	Sweden	Total
Live animals and preparations	1,147	104	285	1,067	9,518	12,121
Vegetal products	26	64	193	877	143	1,303
Fats and oils of vegetal and animal origin	-	549	-	78	6,450	7,077
Food, beverages and tobacco	367	1,216	1,105	2,340	4,329	9,357
Total	1,540	1,933	1,583	4,362	20,440	29,858

Source: National Institute for Statistics, 2012; Own calculations.

Import value by agro-food product group for the Southern EU countries.

The import value with the S EU countries was Euro thousand 436,091 of which 36 % food,

beverages and tobacco, 31 % vegetal products and 29 % live animals and animal preparations. The main import flow came from Italy, Spain and Greece (Table 14).

Table 14. Import value by S EU country and agro-food product group (Euro thousand)

Product group	Cyprus	Greece	Italy	Malta	Portugal	Spain	Total
Live animals and preparations	5,202	11,329	54,728	20	992	52,911	125,182
Vegetal products	398	46,898	73,984	138	90	14,138	135,646
Fats and oils of vegetal and animal origin	-	3,862	11,889	-	-	2,313	18,064
Food, beverages and tobacco	4,024	26,553	89,411	9	10,800	1,422	26,402
Total	9,624	88,642	230,012	167	11,882	95,764	436,091

Source: National Institute for Statistics, 2012; Own calculations.

Live animals trade balance by EU country

The trade with live animals and animal preparations had a negative balance in the case of almost all the EU countries, except Bulgaria, Greece and Slovenia where it had a

positive one. The highest contribution to the negative balance was given by the commerce with Germany, Hungary, Netherlands, Poland, Austria, Spain, France, Denmark and Belgium whose negative impact as a whole accounted for Euro thousand 583,136 (Table 15).

Table 15. Live animals trade balance by EU country, 2010

CE EU		W EU		N EU		S EU	
Austria	-36,672	Belgium	-25,603	Estonia	-1,147	Cyprus	-1,599
Bulgaria	+37,308	Denmark	-26,505	Finland	-104	Greece	+35,374
Czech Rep.	-11,185	France	-30,033	Latvia	-207	Italy	-6,102
Poland	-61,241	Germany	-161,876	Lithuania	-290	Malta	-17
Slovakia	-5,678	Ireland	-1,088	Sweden	-9,129	Portugal	-942
Slovenia	+192	Luxemburg	-54	-	-	Spain	-33,138
Hungary	-154,650	Netherlands	-86,556	-	-	-	-
-	-	United kingdom	+67	-	-	-	-

Source: Own calculations.

Vegetal products trade balance by EU country

A positive impact had Spain, Italy, France, Belgium, Netherlands, Portugal, Cyprus, Germany and Ireland and a negative one the trade with Bulgaria, Hungary, Poland and Slovakia (Table 16).

Fats and oils trade balance by EU country.

The trade balance of fats and oils by EU country showed that the trade with Spain, Greece, Italy, Slovakia, Bulgaria, Cyprus, Portugal, United Kingdom and Austria resided in benefit. The trade with fats and oils with

the other EU countries had a negative balance (Table 17).

Food, beverages and tobacco trade balance by EU country.

The trade balance of food, beverages and tobacco was negatively influenced by the commerce with Germany, Hungary, Poland, Austria, France, Netherlands and Belgium. Also, it was positively influenced by the trade with Italy and Greece and the Nordic EU countries (Table 18).

Table 16. Vegetal products trade balance by EU country, 2010

CE EU		W EU		N EU		S EU	
Austria	-1,525	Belgium	+59,405	Estonia	+44	Cyprus	+23,996
Bulgaria	-192,413	Denmark	-2,992	Finland	+32	Greece	-6,322
Czech Rep.	-8,884	France	+71,080	Latvia	-94	Italy	+89,826
Poland	-19,317	Germany	+18,248	Lithuania	-503	Malta	+3,256
Slovakia	-14,147	Ireland	+6,777	Sweden	-137	Portugal	+38,510
Slovenia	-326	Luxemburg	-44	-	-	Spain	+120,739
Hungary	-140,991	Netherlands	+58,560	-	-	-	-
-	-	United kingdom	+5,780	-	-	-	-

Source:Own calculations.

Table 17. Fats and oils trade balance by EU country, 2010

CE EU		W EU		N EU		S EU	
Austria	+553	Belgium	-3,334	Estonia	-	Cyprus	+1,666
Bulgaria	+2,253	Denmark	-5,563	Finland	-549	Greece	+9,250
Czech Rep.	-1,323	France	-444	Latvia	-	Italy	+6,574
Poland	-3,466	Germany	-18,256	Lithuania	-78	Malta	-
Slovakia	+5,209	Ireland	+1	Sweden	-6,450	Portugal	+1,705
Slovenia	-9	Luxemburg	-	-	-	Spain	+12,381
Hungary	-14,564	Netherlands	-8,008	-	-	-	-
-	-	United kingdom	+597	-	-	-	-

Source:Own calculations.

Table 18. Food, beverages and tobacco trade balance by EU country, 2010

CE EU		W EU		N EU		S EU	
Austria	-46,688	Belgium	-32,313	Estonia	+1,993	Cyprus	-1,159
Bulgaria	+3,971	Denmark	-7,203	Finland	+598	Greece	+8,447
Czech Rep.	-11,310	France	-45,292	Latvia	+1,639	Italy	+224,757
Poland	-115,808	Germany	-152,719	Lithuania	-1,459	Malta	+506
Slovakia	-10,669	Ireland	-2,254	Sweden	-3,254	Portugal	-9,382
Slovenia	+963	Luxemburg	-145	-	-	Spain	-4,373
Hungary	-130,604	Netherlands	-38,075	-	-	-	-
-	-	United kingdom	-23,930	-	-	-	-

Source:Own calculations.

The value of export, import and trade balance were also influenced by the amount of agro-food products and their prices.

CONCLUSIONS

The analysis pointed out the origin of the agro-food trade deficit by EU country group and agro-food product group taking into account the statistical data of the year 2010.

Romania registered a negative trade balance of Euro Thousand 7,032,819. This deficit was caused by the trade deficit with the Central Eastern and Western EU countries, accounting for about 96.91 % and a lower contribution of 2.41 % was given by the Southern EU countries.

Agro-food trade balance was also a negative one registering a deficit of Euro thousand 903,148. This was determined mainly by the unefficient commerce with the CE and W EU countries, which together recorded Euro Thousand 1,400,298 deficit. However, the trade balance was positively influenced by the relationship with the Southern EU countries whose contribution accounted for Euro thousand 513,953.

Therefore, the agro-food trade has to be intensified with the Southern EU countries and to become more relaxed with the CE and W EU countries, especially regarding imports.

The increased share of agro-food trade in Romania's total trade 8.54 % for export and 9.43 % for import reflects that Romanian agro-food products are more and more competitive and more required in the common market.

Romania has to export more processed products which involve more value added. Vegetal products and food, beverages and tobacco are better sold compared to other agro-food product groups.

Live animals are mainly required in the CE and W EU countries, vegetal products in the W and S EU countries, fats and oils in the CE and S EU countries, and finally, food, beverages and tobacco in the S and the CE EU countries.

Agro-food imports have to be substantially diminished as long as Romania's agriculture is able to produce for the internal market.

Imports of live animals and preparations of animal origin, vegetal products and food, beverages and tobacco have to be seriously diminished especially from the CE and W EU countries.

Vegetal products have to be encouraged to be exported in the W and S EU member states, and fats and oils and also food, beverages and tobacco in the S EU countries.

Live animals and preparations of animal origin have to be mainly exported in the Balkan area in countries such as Bulgaria, Greece and also in Slovenia.

Vegetal products have to be exported especially to the W and S EU countries like Spain, Portugal, France, Italy, Belgium, Netherlands, Germany, Ireland, United Kingdom, Cyprus.

Fats and oils could be encouraged to be sold especially in the S EU countries like Spain, Greece, Italy, Cyprus, but also in Portugal, Slovakia and Bulgaria.

Food, beverages and tobacco have to be delivered especially to Italy, Greece, Bulgaria, Slovenia and the Nordic countries.

As a conclusion, Romania's agro-food trade could become more efficient if the balance is analyzed periodically by EU country and country group as well as agro-food product group. It is compulsory to identify the trade partners who determine the increase of the balance deficit and to diminish the imports from those countries and try to intensify the export.

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REFERENCES

- [1]Fruja, I., Milin, Anda, Radac Andreea Mihaela, Merce Iuliana, 2010, Foreign trade in agricultural products of Romania, Scientific Papers, Agricultural Management, Series I, Vol.XII(2), 2010, p.403-408
- [2]Popescu Agatha, 2010, Home and Foreign Trade, Dominor Publishing House, Bucharest, p.270-296
- [3]Popescu Agatha, Study concerning Romania's agro-food foreign trade, 2011, Scientific Papers Agricultural Management, Series I, Vol. XIII, Issue 1, p.99-106
- [4]Zahiu Letitia, Tome Elena, Dachin Anca, Alexandri Cecilia, 2010, Agriculture in Romania's Economy, p.26-30, CERES Publishing House, Bucharest
- [5]Romania's Statistical Yearbook, 2012

CONSIDERATIONS ON THE RURAL POPULATION AS A RESOURCE OF LABOR FORCE IN ROMANIA

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Abstract

The paper aimed to analyze the dynamics of Romania's population and mainly of the rural population in the period 2005-2010. The following indicators were used: total population, rural population, the share of rural population in the total population, active population at national level, in the rural areas and the share of the rural active population in the total population, employment, unemployment, activity rate, employment rate, unemployment rate, employment rate by educational level, employment in agriculture by population's age, active persons by age group. As a conclusion, Romania's rural population accounts for 45 % of total population. A series of restraining factors such as: ageing, low training level, low capital and financial resources, lack of investments and other job alternatives affect the development of the rural areas where most of the population is dealing with agriculture. Rural space requires a multifunctional development meaning to achieve a balanced combination between agriculture, connected industries and services which could create jobs and raise the population income and living standard. This means investments both in agricultural and non-agricultural activities, a new national and local policy concerning the development of rural communities.

Key words: age structure, labor force, living standard, rural population, training level

INTRODUCTION

The development of rural areas has to be seen as a multifunctional use of land, human, capital and financial resources recognizing the limits imposed by the biological, geographical, economical and social environment [2].

Compared to other EU countries, in Romania about 45 % of the population is living in the countryside [7]. The rural space is characterized by many small households, people ageing, low productivity, lack of activity diversification the main economic branch being agriculture of low productivity, low training level of the most people, low chance for jobs and a low living standard. Migration to cities and other countries has become a common phenomenon in the last years looking for jobs[4].

Labor force is the most important factor contributing to the development of the economy. In the transition economies like the one of Romania, labor market is deeply influenced by privatization and restructuring

[6]. Employers require high trained people and especially young but experienced people [3, 5].

For this reason, population structure has to be changed in the best direction by a rational labor force policy both at national and local level. New alternatives and investments have to contribute to the durable development of the local communities and rural space [6]

In this context, the paper aimed to analyze the situation of Romania's population and especially of the rural population concerning employment, unemployment, training level, age structure and professional status in the period 2005-2010.

MATERIALS AND METHODS

The data were provided by the National Institute for Statistics for the period 2005-2010 and were processed using the index, share and comparison methods [8].

The following aspects have been approached: population at national and rural level, the

share of the rural population in the total population, active population at national and rural level, the share of active rural population in the total population, GDP created at national level and also in agriculture, hunting and fishing, BDP/inhabitant, agricultural production value, employment and employment rate at national and rural level, unemployment and unemployment rate at national and rural level, population structure by age group, training level and professional status.

RESULTS AND DISCUSSIONS

The position of the rural population in Romania's population

Romania's population has continuously decreased because of the reduced natality, natural gain and also because of the migration to some people to other countries looking for better paid jobs. In 2010, Romania had 21,431,298 inhabitants by 0.90 % less than in 2005. Urban population has the highest share in the total population: 54.94 % in the year 2005 and 55.05 % in the year 2010. Therefore, rural population has also an important weight in the total population compared to other EU countries. It represents around 45 % of the total population, that is in Romania many people live in the country side (Table 1).

Table 1. Romania's population by area, 2005-2010 (persons)

	2005	2006	2007	2008	2009	2010	2010/2005 %
Total population, of which:	21,623,849	21,584,385	21,537,563	21,504,442	21,489,959	21,431,298	99.10
-Urban population	11,879	11,913,938	11,877,659	11,835,526	11,823,516	11,798,735	99.31
-Rural Population	9,743,952	9,670,427	9,659,904	9,669,114	9,646,443	9,632,562	98.85
Share of Rural population (%)	45.06	44.80	44.85	44.94	44.89	44.95	-

Source: National Institute for Statistics, 2012. Own calculations.

G.D.P. created in agriculture and its share in GDP

Romania's GDP has been continuously developing. In 2010, it accounted for Euro billion 122, being by 54.04 % higher than in the year 2005. The GDP created in agriculture, hunting and fishing has also registered an increasing trend. In 2010, it

accounted for Euro billion 7.4 being by 11.35 % higher than in 2005 [1]. Therefore, GDP created in agriculture, hunting and fishing had a slower increase compared to GDP. As a consequence, the share of GDP created in agriculture, hunting and fishing recorded a decline from 8.45 % in the year 2005 to 6.11 % in the year 2010 (Table 2).

Table 2. Romania's GDP and GDP created in agriculture, hunting and fishing, 2005-2010

	MU	2005	2006	2007	2008	2009	2010	2010/2005 %
GDP	Euro Billion	79.2	97.1	121.2	136.8	115.9	122	154.04
GDP created in agriculture, hunting and fishing	Euro Million	6,700.3	7,616.9	7,181.3	9,266.6	7,622.2	7,461.1	111.35
Share of GDP created in agriculture, hunting and fishing	%	8.45	7.84	5.92	6.77	6.57	6.11	72.30

Source: National Institute for Statistics, 2012. Own calculations.

GDP/capita

GDP per inhabitant registered an increasing dynamic from Euro 3,687.9 in 2005 to Euro 5,791.8 in the year 2011, the gain being

represented by 57.04 %, reflecting an increasing living standard of the population (Table 3).

Table 3. GDP/inhabitant (Euro/capita)

	2005	2006	2007	2008	2009	2010	2010/2005 %
GDP/capita	3,687.9	4,530.4	5,787.7	6,499.2	5,508.5	5,791.8	157.04

Source: National Institute for Statistics, 2012. Own calculations.

Comparing the living standard in Romania with the one registered in all the other EU countries, one can notice that Romania comes

on one of the last positions taking into account GDP/capita as shown in Table 4.

Table 4. GDP/inhabitant in the EU countries, 2010 (Euro/capita)

Country	GDP/capita	Country	GDP/capita	Country	GDP/capita	Country	GDP/capita
Austria	34,100	Finland	33,300	Latvia	8,600	Romania	5,800
Belgium	32,700	France	29,900	Lithuania	8,900	Slovakia	12,100
Bulgaria	4,800	Germany	30,500	Luxembourg	78,600	Slovenia	17,400
Czech Rep.	14,300	Greece	19,600	Malta	15,200	Sweden	37,300
Cyprus	21,00	Hungary	9,700	Netherlands	35,400	United Kingdm	27,500
Denmark	42,600	Ireland	35,000	Poland	9,200	EU-27	24,500
Estonia	10,700	Italy	25,700	Portugal	16,200		

Source: www.epp.eurostat.ec.europa.eu/statistics_explained

Agricultural production value.

Agricultural production increased by 19.19 from Euro million 12,844 in 2005 to Euro million 15,309 in 2010. This is a positive

aspect reflecting that agriculture is an important branch of the economy and is able to better cover population and industry needs regarding agro-food product offer (Table 5).

Table 5. Romania's agricultural production value, 2005-2010 (Euro million)

	2005	2006	2007	2008	2009	2010	2010/2005 %
Agricultural production value	12,844.162	14,370.719	14,299.966	18,191.518	14,143.059	15,309.762	119.19

Source: National Institute for Statistics, 2012. Own calculations.

Economically Active Population

Active population increased by 1.15 %, a low increase. However, in the urban area, active population registered a higher increase of 3.30 %. Rural population declined by about

17.43 %, from 5,361 thousand persons in 2005 to 4,427 thousand persons in 2010. As a result, the share of active rural population in total active population declined from 54.4 % in 2005 to 44.42 % in 2010 (Table 6).

Table 6. Romania's active population by area, 2005-2010 (thousand persons)

	2005	2006	2007	2008	2009	2010	2010/2005 %
Active population, of which:	9,851	10,041	9,994	9,944	9,954	9,965	101.15
-urban population	4,490	4,446	4,500	4,473	5,495	5,538	103.30
-rural population	5,361	5,595	5,494	5,471	4,459	4,427	82.57
Share of rural population (%)	54.4	55.7	54.9	55.0	44.79	44.42	81.65

Source: National Institute for Statistics, 2012. Own calculations.

Employment has continuously increased since 2006 to 2009, but in 2010 it decreased at national level. However, in 2010, its level accounted for 9,240 employed persons, being by 1.01 % more than in 2005. In the rural areas, employment declined by 1.18 % from 4,258 thousand persons in 2005 to 4,208 thousand persons in 2010. In the urban areas,

the situation looks to be better because in 2010 the employed population accounted for 5,032 thousand persons being by 2.92 % higher than in 2005. As a result, the weight of the employed persons in the rural areas remained relatively stable at 45.54 % in 2010 like in the previous years (Table 7).

Table 7. Employment by area, 2005-2010 (thousand persons)

	2005	2006	2007	2008	2009	2010	2010/2005 %
Total employment, of which:	9,147	9,313	9,353	9,369	9,310	9,240	101.01
-rural employment	4,258	4,198	4,281	4,268	4,280	4,208	98.82
-urban employment	4,889	5,115	5,072	5,101	5,070	5,032	102.92
Share of rural employment (%)	46.5	45.0	45.7	45.5	45.54	45.54	97.93

Source: National Institute for Statistics, 2012; Own calculations.

Unemployment

Unemployment increased at country level, reaching 725 thousand persons in 2010, by 2.98 % more than in 2005. However, looking at the data in Table 8, one can see that in 2007 and mainly in 2008 when the economic crises started, the employment registered the lowest levels. Rural employment has recorded

a continuous decline started from 2007. In 2010, 219 thousand people were employed in the rural areas, by about 5.61 % less than in 2005. As a consequence, the share of the employed persons in the rural areas represented about 30 % of the total employment with a decreasing trend starting from 2009 (Table 8).

Table 8. Unemployment by area, 2005-2010 (thousand persons)

	2005	2006	2007	2008	2009	2010	2010/2005 %
Total unemployment, of which:	704	728	641	575	644	725	102.98
-rural unemployment	232	248	219	205	219	219	94.39
-urban unemployment	472	480	422	370	425	506	107.20
Share of rural unemployment (%)	32.9	34.0	34.1	35.6	34.0	30.2	91.79

Source: National Institute for Statistics, 2012; Own calculations.

Activity Rate

Activity rate is higher in the rural space compared to the urban one in the period 2005-2010, despite that a decreasing trend was noticed starting from 2005 till 2010. This

aspect was the consequence of the high weight of the population in the rural areas and also of the economic development encouraged by the EU (Table 9).

Table 9. Activity rate by area 2005-2010 (%)

	2005	2006	2007	2008	2009	2010
Total	62.4	63.7	63.0	62.9	63.2	63.6
Rural	65.3	65.2	65.1	64.5	64.3	64.4
Urban	60.3	62.6	61.6	61.7	61.2	61.6

Source: National Institute for Statistics, 2012; Own calculations.

Employment Rate

Employment rate was also higher in the rural area compared to the urban one. In the year 2010, it reached 60.9 % compared to 58.8 %

in the urban environment. But, rural employment rate has continuously decreased from 61.6 % in 2005 to 60.9 % in 2010, while in the urban areas it has slowly increased from

55 to 56.9 % in the same period of reference (Table 10).

Unemployment Rate

Unemployment rate registered a decreasing trend determined both by Romania's

economic development in the period 2005-2008 and external migration of some people looking for better paid jobs.

Table 10. Employment rate by area, 2005-2010 (%)

	2005	2006	2007	2008	2009	2010
Total	57.7	58.8	58.8	59.0	58.6	58.8
Rural	61.6	61.1	61.5	61.2	60.7	60.9
Urban	55.0	57.2	56.8	57.5	57.2	56.9

Source: National Institute for Statistics, 2012; Own calculations.

Then it increased year by year reaching 7.3 % in 2010, when it was higher than in 2005 because of the impact of economic crisis and the lack of jobs. Unemployment rate declined in the rural areas from 5.2 % in 2005 to 5 % in

2010. A worse situation was noticed in the urban environment where the unemployment rate is very high. However, it declined from 8.8 % in 2005 to 6.9 % in 2010 (Table 11).

Table 11. Unemployment rate by area, 2005-2010 (%)

	2005	2006	2007	2008	2009	2010
Total	7.2	7.3	6.4	5.8	6.9	7.3
Rural	5.2	5.6	4.9	4.6	4.8	5.0
Urban	8.8	8.6	7.7	6.8	6.7	6.9

Source: National Institute for Statistics, 2012; Own calculations.

Employment in agriculture and its share in the national employment

At national level, employment increased by 10.13 % from 8,390 thousand persons in 2005 to 9,240 thousand persons in 2010. In agriculture, hunting and fishing, employment increased only by 3.80 % from 2,678 thousand persons in 2005 to 2,780 thousand persons in 2010. As a result, the share of

employment in agriculture, hunting and fishing in the national employment has slightly declined from 31.9 % in 2005 to 30.08 % in 2010. This is due the larger possibilities in the cities to find a job compared to the rural areas, where mainly agriculture is developed, small industry and services are not well represented (Table 12).

Table 12. Employment in agriculture and its share in the national employment (thousand persons)

	2005	2006	2007	2008	2009	2010	2010/2005 %
Total employment	8,390	8,469	8,726	8,747	9,310	9,240	110.13
Employment in agriculture	2,678	2,518	2,465	2,421	2,610	2,780	103.80
Share of employment in agriculture	31.9	29.7	28.2	27.6	28.3	30.08	94.29

Source: National Institute for Statistics, 2012; Own calculations.

Employment by age group

At national level, the highest employment is situated at the 35-44 years group (28.9 %), then at the 26-34 years group (26.5 %) and 45-54 years group of persons (20.8 %). Therefore both young and mature persons are well employed compared to older people which had a low percentage, only 4.5 %.

In agriculture, hunting and fishing, the age groups have a very close percentage, except the 35-44 years persons which are on the top position with 21.1 %. Also, the young persons of 15-24 years old and the old persons of 65 and over represented 10 % and respectively 14 % showing that the population working in agriculture is aging (Table 13).

Rural Population Age Structure by participation in economic activity reflects that

economically active persons represented 45.8 % in 2008 and the uneconomically active persons 54.2 %, as a consequence of people ageing in the rural communities. The employed people represented 43.5 %. The lower employment

rate of 32 % belonged to one third of the rural population younger than 25.

Therefore, the highest employment rate was registered by people older than 25 years (Table 14).

Table 13. Structure of employment by age group at national level and in agriculture, hunting and fishing in 2010 (%)

	MU	Age groups (years)					
		15-24	26-34	35-44	45-54	55-64	65 and over
Employment at national level	Thousand persons	7.8	26.5	28.9	20.8	11.4	4.5
Employment in agriculture, hunting and fishing	Thousand persons	10.2	17.7	21.1	17.4	18.9	14.7

Source: National Institute for Statistics, 2012.

Table 14. Rural population structure by participation in economic activity by age group in 2010 (%)

Age group	Total population	Active persons			Unactive persons
		Total	Employed	Unemployed	
Total, of which	100	45.8	43.5	2.3	54.2
15-64, of which:	100	64.4	60.9	3.5	35.6
15-24	100	37.8	32.0	5.8	62.2
25-34	100	72.3	68.3	4.0	27.7
35-44	100	80.3	76.9	3.4	19.7
45-54	100	75.1	72.5	2.6	24.9
55-64	100	56.0	55.1	0.9	44.0
65 and over	100	22.4	22.4	-	77.6

Source: National Institute for Statistics, 2012.

Structure of employed population by educational level

For the young people of 25-34 years group, employment rate is higher for the people with a higher education level both at national level (40.6 %) and in the rural areas (39.3 %).

The 35-44 years group with a medium educational level had the highest employment rate at national level (34.2 %). In the rural areas, the highest share belonged to the 25-35

years old people with high education level (39.3) and to the 35-44 year old group with a low training level (35.9 %). Therefore, in the rural areas, high and also low educated people are preferred to be employed. This is a negative aspect reflecting a low training level of rural population with a deep impact on economic development of rural communities (Table 15).

Table 15. Structure of employed population by educational level in 2010 (%)

Education level	Employed population (Thousand persons)	Total 15-64	Of which, age (%)					
			15-24	25-34	35-44	45-54	55-64	65 and over
NATIONAL LEVEL								
Total country	9,240	95.5	7.8	26.6	28.9	20.8	11.4	4.5
-High	1,480	99.6	3.9	40.6	29.0	18.1	8.0	0.4
-Medium	5,437	99.3	7.5	25.4	34.2	23.4	8.8	0.7
-Low	2,323	84.0	11.0	20.4	16.7	16.4	19.5	16.0
RURAL AREAS LEVEL								
Total country	4,208	90.5	10.3	22.2	26.3	17.6	14.1	9.5
-High	145	97.6	6.8	39.3	22.5	17.5	11.5	2.4
-Medium	2,112	98.3	9.8	23.7	35.9	19.9	9.0	1.7
-Low	1,951	81.6	11.0	19.4	16.1	15.2	19.9	18.4

Source: National Institute for Statistics, 2012.

Structure of employed population by professional status and age group

At national level, the highest share belonged to employees (65.60 %), self workers (20.32 %) and family contributing workers (12.49). In the rural areas, there is a similar distribution by professional status: employees 35.67 %, self workers 36.95 % and 26.68 % family contributing workers.

At national level, the employees are preferred to be between 35 and 54 years old, while in the rural areas the employees are preferred to be between 25-54 years old. Selfworkers are mainly older than 35 years both at national level and in the rural areas. Family contributing workers belong mainly to the younger categories between 15- 34 years (Table 16).

Table 16. Structure of employed population by professional status and age group, 2010 (%)

Professional status	Employed population	Of which in age (%)						
		Total 15-64	15-24	25-34	35-44	45-54	55-64	65 and over
NATIONAL LEVEL								
Total, of which:	9,240	95.5	7.8	26.6	28.9	20.8	11.4	4.5
Employee	6,062	99.9	6.5	30.3	32.4	22.5	8.2	0.1
Employer	119	99.5	1.4	20.7	37.0	29.7	10.7	0.5
Self worker	1,878	85.0	4.7	17.3	24.2	19.6	19.2	15.0
Family contributing worker	1,177	88.9	20.3	22.9	17.8	12.6	15.3	11.1
RURAL LEVEL								
Total, of which:	4,208	90.5	10.3	22.2	26.3	17.6	14.1	9.5
Employee	1,501	99.9	9.4	28.6	35.6	19.6	6.7	0.1
Employer	26	99.7	2.0	26.7	36.6	24.6	9.8	0.3
Self worker	1,555	82.5	4.0	15.5	23.2	19.2	20.6	17.5
Family contributing worker	1,123	88.8	20.4	22.9	17.8	12.6	15.1	11.2

Source: National Institute for Statistics, 2012.

CONCLUSIONS

About 45 % of Romania's population is living in the rural areas. The main activities are represented by agriculture and raw material processing in the household.

The lack of technical endowment and financial resources, people ageing, the lack of jobs, low training level and low productivity are the main characteristics of the rural areas.

Agriculture had a higher and higher contribution to GDP, but investments in this sector are still modest, so that productivity is still at low level. Non agricultural sectors are less developed in the rural communities and oblige mainly young people to look for jobs in the cities or to emigrate in other EU countries. Modernization of the rural space involves the multifunctional development combining

agriculture, connected industries and services which could create jobs and raise the population income and living standard. This means investments both in agricultural and non-agricultural activities, a new national and local policy concerning the development of rural communities.

A special attention has to be paid to the young people in order to encourage them to remain in the local communities, to set up farms and develop their own business, to work in the public administration etc.

The development of the rural areas requires a change of population behaviour and mentality, more involvement of the decision makers both at national and local level to find the best solutions for stimulating the multifunctional development of the rural space.

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REFERENCES

- [1] Amariei Razvan, 2011, How Romania's GDP has developed compared to 1989, Revista Capital, May 19, 2011
- [2] Dachin Anca, 2006, Perspectives of reducing rural-urban disparities in Romania after accession to the EU, in "Multifunctional agriculture and rural development-development of local communities", Belgrade, December 7-8, 2006
- [3] Dostie, B., Sahn, D., 2006, Labor Market Dynamics in Romania during a period of Economic of Liberalization, Forschungsinstitut zur Zukunft des

Arbeit, Discussion Paper No. 2511, IZA, Bonn, Germany.

[4] Popescu Agatha, Grigoras M.A., 2011, Research concerning Rural versus Urban Population – Present and Prospect, Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development, Vol.11, Issue 2/2011, p.157-161

[5] Svejnar, J., 1999, Labor markets in the transitional CEECs economies. Handbook of Labor Economics, vol. 3 b, p. 2809-2858, Amsterdam, Elsevier Science.

[6] Voicu, A., 2005. Employment dynamics in the Romania labor market: A Markov Chain Monte Carlo approach. Journal of Comparative Economics: 33(3); 604-639.

[7] Zahiu Letitia, Toma Elena, achin Anca, Alexandri Cecilia, 2010, Agriculture in Romania's Economy, CERES Publishing House, Bucharest, p. 43-46.

[8] Romania's Statistical Yearbook, 2012

[9] Eurostat, Statistical Database, 2012, www.epp.eurostat.ec.europa.eu/statistics_explained

ANALYSIS OF INTENSITY OF COMPETITION IN MILK AND MILK PRODUCTS SECTOR IN BULGARIA

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Abstract

The following paper presents the results of an analysis of the intensity of competition in the milk and milk products sector in Bulgaria. The analysis is performed by adapting the Porter's five forces model and based on the specific features of the sector concerned. For this purpose the author accepts the industrial concept of interpretation of competition: two levels of consideration of the competition intensity are differentiated - product class as a whole and separate product categories. Although not going into greater depth, the study reports the need of deepening the analysis by individual product groups, price levels and specific segments. The author proposes a methodological framework by which an analysis of the intensity of competition is conducted. Due to volume limitations of the publication, the emphasis of the paper is on the intensity of competition between existing companies; the barriers to enter and exit the sector are also presented; substitute products are marked briefly. The remaining forces from the five forces model are marked without going into details.

Key words: competition, intensity of competition, market, sector, substitute products

INTRODUCTION

The literature on the issues of strategic management gives a central attention to the matters related to strategic analysis and the intensity of competition in particular as its main component [1],[2],[3],[4],[5],[6].

However, their examination is performed mainly on a conceptual basis, which prevents their implementation in a particular sector, without considering its inherent characteristics.

Subject of study in the current paper is the intensity of competition in the milk and milk (dairy) products sector. For this purpose, the Porter's five forces model is applied [1]. It is widely accepted by scientists and researchers in managerial and marketing scientific area [5], [6], [7], [8], [9], [10], [11], [12].

In its particular application in practice, the model needs to be adapted, which reflects the sectoral specificities and characteristics [1],[7].

Characteristics of the object of study

Object of study in the current paper is the milk and milk products sector in Bulgaria as a strategic business area.

The sector is characterized by intense competition and dynamically changing environment. Within its boundaries it is identified a wide variety of companies which are distinguished by their size, product specialization, market coverage, objectives, strategies, product and market profile.

Dynamically changing environment is determined by: opportunities for entry and exit of competitors in the sector; continuous change in consumers behavior; changes in the meaning of the different communication channels and specific means; restructuring of distribution channels; development of substitute products; strong vertical integration with the raw materials suppliers; specific regulatory actions and regulations that affect the industry; disloyal competition.¹

The thesis stated in the paper is that the analysis of intensity of competition in the selected sector is characterized by its specific features. The intensity of competition could be determined only if the product profile of

¹ Author's research in relation to individual university project № 2-7/2011, UNWE, Sofia: Characteristics of business planning in companies from the FMCG sector in Bulgaria / Completion date: December 2013

the sector and these of the leading competitors are determined [5, 15].

The aim of the paper is to present the results of adapting the Porter's five forces model in the sector of milk and milk products in Bulgaria. Due to the popularity of this model its theoretical aspects are not considered in this paper.

MATERIALS AND METHODS

At the basis of the applied methodology for studying the intensity of competition is the complex approach. For this purpose, a variety of popular methods are used: analysis and synthesis, induction and deduction, structural and comparative analysis, methods for grouping, method of analogy, graphical methods, expert assessment, statistical methods, etc.

The scope of the study covers 24 of the leading manufacturers of milk and milk products in Bulgaria which are of national importance. Primary and secondary information sources are used. For the collection of primary information is performed author's own research, which includes: analytical review of the websites of the companies involved, visiting the companies' stores, interviews with managers and owners.

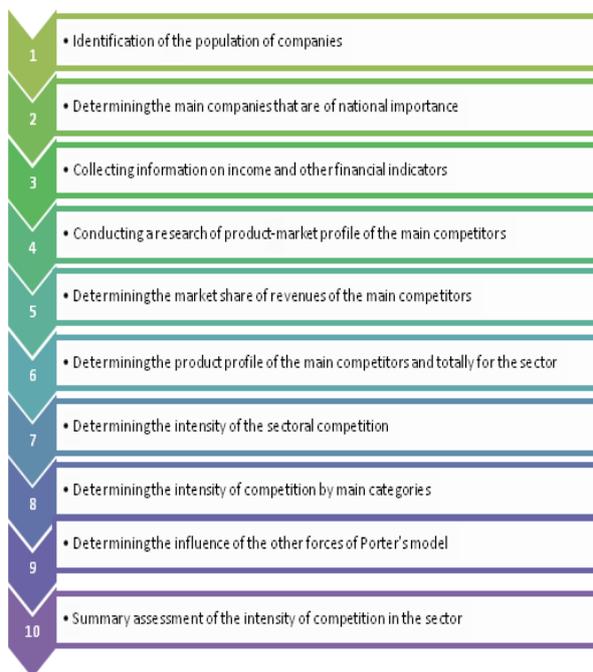
The secondary data sources that are used are official financial and accounting documents [14], analyzes of the Ministry of Agriculture and Food (MAF) concerning the market of milk products in Bulgaria [13], data from the Bulgarian Association of Dairy Processors [14].

Methodological framework of the study

The study is carried out by a specially elaborated methodological framework (figure1).

It takes into account all of the starting conditions and limitations. The methodological framework enables the performing of a reliable analysis of the intensity of competition even in conditions of information deficit This makes it suitable for application by large companies, as well as by medium and small ones experiencing

difficulties in the development of management information system due to lack of experience or lack of financial resources.



Source: Elaborated by the author

Fig. 1. Methodological framework of the study

The proposed methodology allows the determination of the sector's structure and the intensity of competition in the sector by the Porter's five forces model.

RESULTS AND DISCUSSIONS

In adapting the five forces model are considered some of the important features of the sector associated with: large product diversity, presence of large number of competitors which are distinguished by size, objectives, strategies, financial resources and product-market profile.

The product diversity is a matter of particular interest. The milk products class includes a variety of product categories such as: yoghurt (sour milk), fresh milk, white cheese, yellow cheese, fruit yogurts, fresh fruit milk, bifitus/probiotics, butter, cottage cheese, sour cream, different children's products, etc. Because of this diversity the matters related to product-market profile of the sector and main

competitors acquire significant importance [14].

The identification and analysis of competition is enabled by the application of industrial and market concepts [5]. The first is necessary in order to define the product boundaries in the sector as well as the different product categories, and the second – for the identification of competitors and differentiation of market segments and strategic groups [1], [2], [3], [5].

In order to refine the boundaries of the sector, the concept of strategic business areas and strategic business units is applied [2], [3].

For the aims of the current paper, the industrial concept is considered. Because of this, the adaptation of the model requires introduction of two levels of determination of the intensity of competition: the first refers to the analysis of competition in the product class as a whole, and the second - for the separate product categories.

The market concept requires the analysis to be conducted in separate geographic markets, market segments and distribution channels.

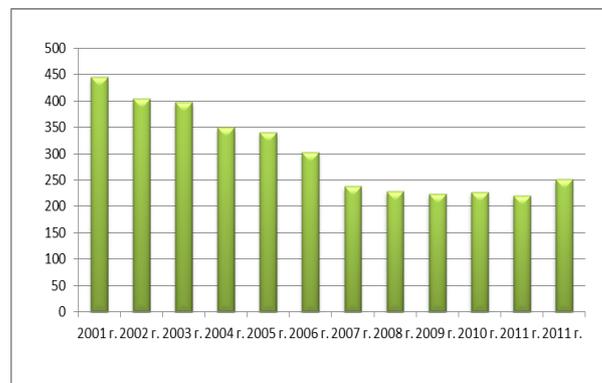
Due to the necessity of a thorough and detailed market research, this paper is limited to the analysis of intensity of competition, which is assumed by the industrial concept.

A. Intensity of sectoral (within the class) competition

There are many companies operating within the class. They are different by size, legal form, product specialization, market coverage. The companies include in their scope of business activities manufacturing and trade with milk products and are approved for trade in the EU [13], [14].

Figure 2 shows that the sector is characterized by high intensity of competition throughout the period considered. In 2011, the number of dairy processors in Bulgaria is around 450. In the following years (2002-2007) the competitors' number decreases to 229, retaining at this level until 2010. In 2011 there are 252 companies identified which are included in the list of approved establishments

for manufacturing and trade with food products of animal origin.²



Source: MAF, department "Agrostatistics" [12]

Fig. 2. Dynamics in the number of dairy processors in Bulgaria for the years 2001 - 2011

Although the number of competitors is changing over the years, this doesn't result in reduction of the intensity of competition. Even significantly fewer in number, the operating competitors have a capacity that significantly exceeds the current market absorption. In the conditions of shrinking market, the competitors implement more aggressive strategies and programs for retention the levels of sales, revenues and profits.

There could be identified 24 leading companies of national importance in the dairy sector. They are crucial for the existence of intense competition in the sector. The study conducted allows to be presented a brief information about the companies' sales revenues and product-market profiles.

DANONE SERDIKA S.A. is the absolute Leader in the milk products class with revenues amounting to 98 870 thousand Levs. This represents 25% of the surveyed companies' turnover. The revenue of *DANONE SERDIKA* exceeds more than twice or more than 100% the Challenger's revenues represented by United Milk

² List of approved establishments for intracommunity trade with food products of animal origin, covered by Annex III of Regulation (EC) No 853/2004 of the European Parliament and of the Council

Company (UMC) S.A. and more than three times the first two followers' revenues - respectively TYRBUL S.A. and CODAP Ltd.

Product Portfolio: The Leader of the market has clearly defined product specialization, which focuses on the manufacturing and sale of various types of milk on the market without including other categories of milk products and offering a rich assortment. It covers almost all product categories within the product class and drives innovations in the sector. The Leader uses separate family brands for each product category.

In general, the products of DANONE SERDIKA are oriented towards children, adolescents and young people who are very loyal to the brand and have a serious impact on the purchases. The company aims to take a leadership position in each of the segments covered as it is the undisputed leader in the following categories: fruit milk drinks, fruit yogurts, bifitus.

DANONE SERDIKA is a global innovative company which applies a differentiated marketing with precise segmentation and positioning of the products. It is a driver for change in the sector in the following aspects: introduction of new technologies; process, product and marketing innovations.

DANONE SERDIKA is most active in the marketing support for its products. Due to the highly developed distribution network and aggressive advertising, it provides rapid penetration and imposing its new products on the market. The company implements differentiated marketing and its marketing efforts are aimed at precisely selected target segments. Its brands ("Danone", "Activia", "Danonino", "DZP", "Na baba", "Fantasy") have a precise positioning and leading position in the minds of consumers.

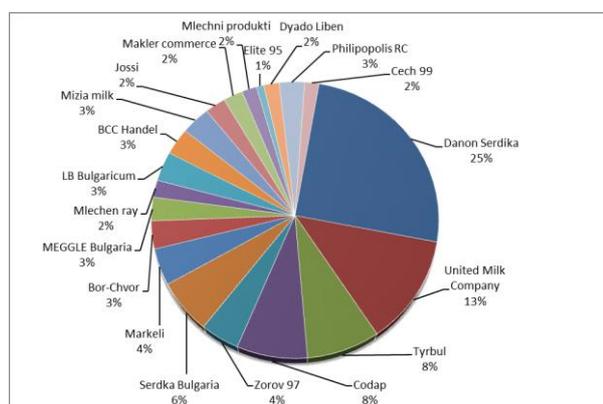
The company has serious financial capabilities exceeding those of the other competitors, enabling to ensure financial recourses for its marketing budgets.

United Milk Company (UMC) S.A. is the main Challenger in the sector. Its revenues amounts to the value of 49 271 thousand Levs, which is 13% of the turnover of the population surveyed and 50% of the revenues of the Leader.

The product portfolio of UMC includes: yogurt and fresh milk, including skimmed milk, with calcium, UHT, fruit milk drinks, including flavored and lactic acid, cocktails, cheeses. The company's yogurts are offered with the following brand names: "Vereia", "Fibella", "Hansko", "Vitalact", "Vereia-Calcium", "Vereia 0%". Leading brand, which is positioned at the highest price level having the largest share of the company's sales, is "Vereia". It is also one of the most recognizable brands on the market of fresh milk and yoghurt.

UMC is oriented towards product innovations. In recent years, the company introduced and established on the market fresh milk and yoghurt with zero fat and with calcium, which are offered under the family brand "Vereia-0%" and "Vereia-calcium". In respect of technology the company is one of the leading in the sector.

UMC has well developed distribution network nationwide, which is accompanied by a well developed system of trade supplies. The company's merchandising provides a good presence in the retail stores. In recent years the company is experiencing some problems of financial nature.



Source: The author's research, based on data from the Bulgarian Trade Register, 2012. [14]

Fig. 3. Market shares of the leading companies in the Milk and Milk Products sector, by revenues

TYRBUL S.A. had a turnover of 31 322 thousand Levs and ranks third in the sector. Although the position occupied, it is not given a special attention, because its products are mainly for export. In Bulgaria its brands could be found in some regions and retail chains that have limited market presence. *TYRBUL's* products are in the following categories: yogurt, fresh milk, white cheese, strained yoghurt, cottage cheese. The company owns the family brand "Olimpus" and sub-brands: "Oly", "Feta", "Talia", "Elekton". In case of an appropriate strategy, the company has the potential to intervene more seriously on the milk products market in Bulgaria.

CODAP Ltd. ranks fourth in turnover and is also export oriented. Its turnover is just over 30 144 thousand Levs, which gives it one of the leading positions in the sector. The *CODAP's* revenues represent 8% of the total revenues of companies concerned, 31.0% of the Leader's (Danone Serdika) sales and 63% of *UMC's*. *CODAP* is a subsidiary company of a German company with the same name. The vast majority of the cream produced by the company is intended for export.

The product portfolio of the company includes most of the main categories dairy products: yogurt, fresh milk, milk drinks, including fruit and flavored, white cheese, yellow cheese, cream for cooking. They are offered under the family brand "My day". *CODAP* offers a wide variety of fresh milks with different fat contents, calcium, fitness and for children, respectively, in box and bottle. The company offers a full children's serie under the brand "Mlechno". The company's products are distinguished by their packaging that attracts consumer attention.

The company offers its products mostly in city regions and is presented in most of the channels through which the products under the brand "My Day" reach their target markets. The brand products have active marketing support. They are well represented in terms of merchandising and distinguished by the loyal customers.

Zorov 97 Ltd. has a turnover of 16 730 thousand Levs which represents 4.0% of the

turnover of the companies surveyed and 17.0% of the Leader's revenue. The product portfolio of *Zorov 97* includes traditional Bulgarian dairy products: yogurt, white cheese, yellow cheese, cream, butter and also various delicacies. "Parshevitsa" is one of the milk products brands which are recognizable, liked and preferred by the market. Products with the brand name "Parshevitsa" are distributed through a well-developed distribution network and merchandising support.

Two of the companies that by 2009 had a leading position with sales of over 20 000 thousand Levs - *FAMA SERDIKA S.A.* and 16 689 thousand Levs - *MARKELI S.A.*, respectively with 6% and 4% market share, in 2011 are in difficult financial situation. Others, including: *MEGGLE Bulgaria Ltd.*, *Mlechen ray - 2 Ltd.*, *LB Bulgaricum S.A.*, *BCC Handel Ltd.*, *MIZIA MILK Ltd.*, *JOSSI Ltd.*, *MAKLER COMMERCE Ltd.*, *Mlechni produkti Ltd.*, *ELITE 95 Ltd.*, *Dyado Liben Ltd.*, *Philipopolis RC Ltd.* and *CECH 99 Ltd.* have approximately equal market shares of the revenues - between 2-3%. Their total revenues amounted to over 111 000 thousand Levs, which is about 28% of the revenue. The lowest in this group are the revenues of *ELITE 95* and the highest - of *MIZIA MILK*. The examined main competitors and the others more than 200 companies operating in the dairy sector in Bulgaria, determine growing intensity of competition, increased further by the difficult economic situation.

B. Intensity of competition in key product categories

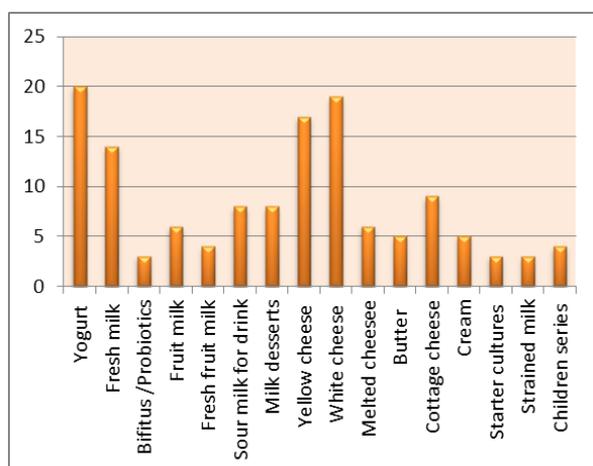
The performed analysis outlines the product profile of the sector, which is a result of the diverse products offered by the competitors (figure 4).

Based on the study of product profile of 24 leading companies in the Milk and milk products sector are identified a number of characteristics associated with the intensity of competition.

The most intensive competition is between the companies offering traditional for the Bulgarian taste milk products - yogurt, fresh milk, yellow cheese and white cheese. Yogurt

is offered by 20 companies which is 83% of the population surveyed, fresh milk is offered by 14 companies (58%), yellow cheese - by 17 and white cheese - by 19 companies, respectively 71% and 79%. Usually, for these types of products the companies create and establish family brands.

Lowest number of competitors (three companies) are identified in the segment of bifitus products and its alternative - probiotics. The situation is similar for strained milk and starter cultures (three companies) and for the children series - four companies. The number of companies offering fresh fruit milk, butter and cream is also small.



Source: The author's research, 2012. (Sample: 24 leading companies from the milk and milk products sector)

Fig. 4. Number of competitors by product categories

C. Main competitors on the market of traditional milk products

1) Competition on the yogurt market

Each of the companies considered below offer different strategies and approaches to "Yoghurt" product line. The retail chains actively participate in the lowest price segment by their own brands. [15]

- *United Milk Company (UMC) S.A.* operates with its leading brand "Vereia" which is one of the most recognizable brands on the market. Along with it, the company also offers other recognizable brands yoghurt with good market positions like - "Fibella", "Hansko", "Vitalact". Thus UMC managed to introduce products for different market segments.

- *BOR-CHVOR Ltd.* offers yogurt with the same brand name, which is one of the leading on the market. Other company's brands for the lower price segment are: "Taboo", "Element", "Hypnosis", "Culture", "Elvi", "Plovdiv", "Babino valshebstvo". Leading brand in the high price segment is "Bor Chvor".

- *DANONE SERDIKA S.A.* is a leader with its brand "Danone" and especially with the brand „Na baba" that embodies, at least nominally, the Bulgarian tradition. The brand "Na baba" has the most significant marketing support and best image positioning than any other, which in a short time made it a favorite brand for many yogurt consumers.

- *Rodopeya-Belev Ltd.* is the manufacturer of yogurt with the brand name "Rodopeya", which in recent years was established as one of the favorite products in this category. The manufacturer of the brand imposes it as a product of the Rhodope Mountains. This by default makes it desirable because of the positive image of the mountain, which is associated with natural beauty and ecologically cleanness and purity.

- *ELVI Bulgaria Ltd.* manages to build a strong brand without using intensive communication campaigns. The company's brand "Bojenci" become one of the preferred products on the market for a short time. Similarly to the strategy of "Rodopeya", the brand "Bojenci" creates associations for the village with the same name, which, as a historical landmark, keeps the spirit of Bulgaria and is a symbol of its native traditions.

- *Zorov 97 Ltd.* – its brand is called "Parshevitsa". Despite the dissonant brand name, the company had established it on the market and its yogurt is preferred by the customers. Its significant market presence is imposed by the shared application of pull and push strategy.

- *BCC Handel Ltd.* is another main player on the market. Its yogurt with the brand name "Elena" is preferred by the customers because it is produced with probiotic yeast. In Internet forums present opinions that its taste is closer

to the home-made yoghurt. Named after the picturesque mountain town of Elena the product inherits 40-year tradition of the existing dairy.

• Other key competitors on the market of yogurt, some of which have the potential for more significant presence, are:

- *CODAP Ltd.* with its brand „My Day“;
- *TYRBUL S.A.* with its brand „Oly“;
- *SERDIKA BULGARIA S.A.* with its brands „Markeli“, „Mlechen pat“, „Elitsa“;
- *LAKTIMA S.A.* with its brand „Balkan“.

There are numerous other companies on the market, including operating at regional and local level, which also attract loyal consumers.

2) *Competition on the fresh milk market*

The fresh milk is a traditional product for the Bulgarian cuisine. It is also a category with high competition. Of the surveyed 24 leading companies, 14 (54%) offer fresh milk. In recent years the UTH technology was imposed. It allows long storage period of the milk, without deterioration to its quality and characteristics.

Key companies with leading positions on the fresh milk market are:

• *United Milk Company (UMC) S.A.* with its brands “*Vereia*”, “*Fibella*”, “*Hansko*”. Leading brand of the company is “*Vereia*”. It offers several varieties of milk intended to serve different consumer segments: milk containing 1.5%, 3.6%, 0% fat, and “*Vereia-Calcium*”. “*Fibella*” is produced by UTH technology. The company's brands are supported by good logistics to ensure constant availability at points of sale, where, almost without exception, they have leading position. The milk is offered in various tetrapack containers with caps. For convenience, the “*Hansko*” milk is in a quality, comfortable and eco-friendly packaging “*Ecolean*”. The “*Vereia*” brand has active advertising support.

• *CODAP Ltd.* is another of the leading companies on the fresh milk market. Its single brand is “*My Day*”, which is also established on the international market. This product is available in packaging that attracts the consumers with its shape and color. Compared with the brands of UMC, “*MyDay*”

brand has a greater depth: with a fat content of 1.5%, 3.0%, Fitness-0,1%, with calcium, for children - “*Mlechno*”, UTH technology. It is offered in both convenient and hygienic PET bottle and tetrapack container. This packaging does not allow the product to absorb smell from the refrigerator and allows better storing.

• *DANONE SERDIKA S.A.* - its leading brand for traditional Bulgarian products is “*Na baba*”. Due to the active marketing support and good positioning, the brand has become one of the most preferred. One of its main advantages is the packaging that has a wide neck that makes the product very convenient to use. Danone also offers fresh milk under the same brand name, but with no significant market presence.

• *MEGGLE Bulgaria Ltd.* – its brand “*MEGGLE*” is one of the recognizable brands on the Bulgarian market. The fresh milk with this brand is distinguished by its great taste. It is available with different fat content - 3.6%, 1.0% and 0.1%. The special line of fresh milk *MEGGLE* “*FRESH every day*” is produced by a technology that keeps the authentic and natural flavour and taste of the cow milk.

• Other important competitors on the fresh milk market are *SERDIKA BULGARIA S.A.*, *ELITE 95 Ltd.*, *BALKAN SPECIAL Ltd.*, *POLIDEY-2 Ltd.*, *Zorov 97 Ltd.*, *BORCHVOR Ltd.* and others.

3) *Competition on the cheese products market*

Two of the products traditional for the Bulgarian manufacturers, which are an integral part of the Bulgarian cuisine, are white cheese and yellow cheese. These two categories are characterized by a dynamic competition, product and process innovations.

White cheese

Examination of the competitors’ profile, conducted among 24 of the leading producers of milk and milk products, indicates that 19 of them produce white cheese. According to Nielsen, published on the website “*My shop*”, the best selling cheeses are “*Davidovo*”, “*Elena*”, “*Madjarov*”, “*Makler*” and “*Sitovo*” [16, 17]. The largest share of sales has the cow's milk cheese - 92.8%. Second with 4.3%

ranks the sheep's milk cheese. The goat's milk cheese has 1.5% of total sales. More than two-thirds of sales (67.2%) are due to non-factory packaged cheese, and the rest is for the factory packaged cheese (tin container, box, foil/paper, cardboard). In this category, it is important to note the specialization, product and technological innovations of JOSSI Ltd. which offers a wide variety of cheeses.

Yellow cheese (Kashkaval)

The yellow cheese is the third by intensity milk products category after yogurt and white cheese - 17 of the surveyed companies include it in their product portfolio. Data from the commercial panel Nielsen shows that the best selling packaged cheeses are "Domlyan", "Madjarov", "Merone", "Na baba" and "NDN&K" [18]. The best selling cheese is made of cow's milk - 87.2%. Second is the cheese of sheep's milk - 10.7%. Third ranks the products of goat's milk with 1.4%.

D. Barriers to entry and exit in the sector

Entry barriers

The dairy sector is characterized by a number of features that create relatively high entry barriers for new competitors:

- ✓ High economic requirements for market researches, initial investments in tangible and intangible assets.
- ✓ Significant financial resources are required to provide initial working capital.
- ✓ Requirements for high technological level of manufacturing and need of qualified professionals in manufacturing, marketing and sales.
- ✓ In the different market segments and strategic groups are observed leaders who are "persecuted" by one or more competitors that threaten their leadership.
- ✓ Market entry is hampered by difficult entry and penetration in the traditional distribution channels and store chains, which occupy an increasing market share.
- ✓ Various studies show that consumers of dairy products are loyal to one or a couple of brands. This loyalty is result of creativity, serious communication expenses and consistency in the products' quality.
- ✓ The entry barriers are determined also by a number of legal requirements related to

sanitary, product and other requirements that must be met in order to start dairy products manufacturing.

✓ The economic barriers include also the experience curve, economies of scale, access to technology and know-how, specialized transportation requirements.

✓ In the current conditions the barriers are even higher as the market shrinks, and the competitors strive to maintain their market position and to occupy new ones.

Exit barriers

In contrast to entry barriers, the exit ones are not so high. The decision to exit the sector is related to assessment of the appropriateness and the economic and financial condition of the particular company.

If the company is not declared in bankruptcy and has no signed contracts that could prevent the exit of the sector, the decision can be taken at any time.

E. Substitute-products

In most of the cases substitute product of a particular milk product could be only another product of "Milk products" class. As existing and potentially close substitute products are considered the different products within a particular product category. For example, substitute product of traditional yogurt is the plant-based yogurt. In other cases, more distant substitute products could be the different product categories to each other - depending on the reason for purchase, such are: white cheese and yellow cheese, white cheese and cottage cheese, yogurt and fruit yogurt, etc.

It is important to notice that years ago the milk was produced by a classical and proven recipe and the main component of the dairy products was fresh raw milk. At present there is a serious market share of plant-based milk containing different types of plant additives.

F. Main pricing factors

The prices of milk and milk products depend on the development of the main manufacturing expenses. The retention of feed prices on higher levels and their possible further increase will inevitably affect the prices of milk and milk products in the upward direction.

At the same time, a significant increase in prices of dairy products will be limited by the low purchasing power of the population, including by shifting the demand to cheaper products but with lower quality. In this respect, it should also be appended the excess of production capacity in the sector.

The chain stores also have an adverse impact on the manufacturers' prices. They execute pressure on the manufacturers for different forms of promotions and discounts, and in some cases even force them to sell their products at a loss. Moreover, almost all chain stores offer their own brands which are positioned in the lower price segment.

ACKNOWLEDGMENTS

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CONCLUSIONS

First, the analysis conducted shows that the sector is experiencing a high degree of competition, due to several key factors:

✓ Large number of competitors in the sector. According to the MAF their number is 252.

✓ A decrease in demand of milk products which is a result of continuing difficult economic situation worldwide.

✓ In these conditions there is observed a decrease in the frequency of purchase of milk products, downward pressure on product prices and shrinking of margins.

✓ The presence of many companies in the sector is an important factor that intensifies the competition in "Milk products" class and its inherent categories and product groups.

✓ Despite the opportunities for differentiation of the companies' offers in the dairy sector, within the separate strategic groups formed on the basis of ratio "price-quality-differentiation/positioning" is observed intense

competition. Such is identified also between the formed strategic groups.

✓ There is overcapacity in the sector, which can not be used due to the decline in demand. That is why there is an orientation towards lower product prices.

✓ The worsened economic conditions adversely affect the "balance" of the competition. In search of options for keeping the level of revenues and maintaining the desired profitability, competitors act in accordance with the conjuncture, without long-term strategies.

✓ Disloyal business practices are another unfavorable factor. They result in non-payment of VAT (value added tax) and use of low-quality raw materials.

✓ As a result of the factors with unfavorable impact it is observed: a decrease in companies' sales and revenues, deterioration of profitability in the sector, poor liquidity.

Second, the results presented by the current paper indicate that by adapting the Porter's five forces model and analysis of product-market profile it is possible to assess the intensity of competition in the milk and milk products sector.

Third, the proposed methodological framework allows the analysis of intensity of competition even in the circumstances of low initial provision of information. Due to the low cost required for its practical application, it can be used by both small and big companies not only in the sector concerned but also for all FMCG.

REFERENCES

- [1]Porter, M., 2008, 1th edition Competitive strategy: techniques for analyzing industries and competitors, New York: Free Press, p.164-201.
- [2]Ansoff, I., 1965, 1th Edition, Corporate strategy: an analytic approach to business policy for growth and expansion, N.J.:McGraw-Hill, p.5-30.
- [3]Ansoff, I., 2007, Classical Edition, Strategic Management, New York: Palgrave Macmillan, p.29-47.
- [4]Mintzberg, H, Quinn, J.B. Ghoshal, S, 2003, 4-th Global edition, The Strategy Process: Concepts, Contexts, Cases, Pearson Education, p. 315-326.
- [5]Kotler, P., Marketing management. 11th edition. New Jersey: Prentice hall, p. 243-247.

- [6] Hill, Ch., Jones, G., 2009, Strategic Management - Theory: An Integrated Approach, USA: Cengage learning, p.45-117.
- [7] Miles, D. A., 2011, Risk Factors and Business Models: Understanding the Five Forces of Entrepreneurial Risk and the Causes of Business Failure, Florida: Universal-Publishers, p.33-45.
- [8] Grant M. R., 2010, Contemporary Strategy Analysis: Text Only, 2011, John Wiley and Sons, p. 211-220.
- [9] Ahlstrom, D., Bruton, G. D., 2009, International Management: Strategy and Culture in the Emerging World, Mason, OH: Cengage Learning, p.131-137.
- [10] Simon, H., 2009, Hidden Champions of the Twenty-First Century: The Success Strategies of Unknown World Market Leaders, Springer, p.195-197.
- [11] Johnson, G., Scholes, K., 2010, Exploring Corporate Strategy, 8-th edition, Whittington, R, FT: Prentice Hall, p. 53-93.
- [12] Henry, A., 2008, Understanding Strategic Management, Oxford University Press, p. 53-93.
- [13] www.mzh.government.bg/MZH/bg/ShortLinks/SelskaPolitika/MarketMeasures/Sectors/Milk.aspx
- [14] <http://www.milkbg.org/http://public.brra.bg/CheckUps/Default.ra?0>
- [15] http://www.cmgbg.com/htdocs/data/archive/2009-04/focus_food.pdf
- [16] <http://www.mystore.bg/n/n%D0%BEvini/2012/pazarno-proucvane-otnosno-pazara-na-sirene-v-balgaria>
- [17] <http://www.regal.bg/show.php?storyid=2084599>
- [18] <http://www.mytore.bg/n/n%D0%BEvini/2012/pazarat-na-paketiran-kaskaval-v-balgaria>

THE UTILISATION OF GRAPE MARC FOR OBTAINING FEED PROTEIN WITH ETHANOL CONSUMING YEASTS

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Key words: *Candida robusta*, feed protein, marc, wine yeast

Abstract

The research presented in this work has been directed to achieve an optimal and economic medium, for the protein biosynthesis. The carbon source and the mineral elements are provided by the fresh marc diffusion solution and the source of organic nitrogen and growth factors are provided by proteic wine yeast extract. For the alcoholic fermentation it was used a strain of Saccharomyces ellipsoideus and for obtaining the biomass, a strain of Candida robusta. There were performed two series of experiments in which the alcoholic fermentation progress was monitored as follows: by titration of the carbohydrates, at the beginning and respectively at the end of the fermentation; by determining the optical density of the culture medium and by the determination of alcohol in the fermented solution. Protein biosynthesis was monitored by measurement of the alcohol concentration at the beginning and end of the process, by the determination of the optical density of the culture medium, by the determination of residual sugar, and by determining wet and dry biomass. The wet biomass was used for the protein titration. At the termination of the bioprocess was determined the dry matter in the culture medium.

INTRODUCTION

Grape marc is considered a waste byproduct of the wine industry and high quantities of this secondary product are released in the environment every year [1], becoming eventually a major disposal problem in the waste management of this industry [2]

It is basically used in low value products as fertiliser in the agriculture [3,4]. However, grape marc is a promising source of many compounds [5] including polyphenols, fibres, tannins, tartaric acid, citric acid, anthocyanin and neutral sugars [6] which can be used for their nutritional properties [7].

Our research is targeted on the utilisation of this so called waste in an economical and effective way.

The aim of this study was to achieve an optimal and economic culture medium, for the protein biosynthesis. The carbon source and

the mineral elements are provided by the fresh marc diffusion solution and the source of organic nitrogen and growth factors are provided by proteic wine yeast extract.

MATERIALS AND METHODS

The biological material used in the experiments was the marc resulted from the processing of white wine grapes and wine yeast (yeast sediment from fermentation of white and red wines). The marc was obtained from the continuous press and contained only the skin and seeds, the clusters being previously removed. The marc was sampled immediately after pressing, therefore it was fresh, unfermented, and obtained from healthy grapes. Both wine yeast and the marc were distributed immediately after harvesting in plastic bags and stored in a freezer at -12 °C.

The *Saccharomyces ellipsoideus* strain used in the alcoholic fermentation process was previously isolated from the marc. To obtain the biomass we tested a strain of *Candida robusta*. The experiments were performed in 750 ml Erlenmeyer flasks on a shaker with adjustable speed. For the alcoholic fermentation was used the minimum speed, because this kind of fermentation requires a high consumption of oxygen [8], and the temperature was set to 28 °C.

The alcoholic fermentation progress was monitored as follows: by titration of the carbohydrates, at the beginning and respectively at the end of the fermentation; by determining optical density (OD) of the culture medium and by the determination of alcohol in the fermented solution. Protein biosynthesis was monitored by measurement of the alcohol concentration at the beginning and end of the process, by the determination of OD of the culture medium, by the determination of residual sugar, and by determining wet and dry biomass. The wet biomass was used for the protein titration. At the termination of the bioprocess was determined the dry matter in the culture medium.

Spectrophotometric determination of sugars

The principle of the method - the method of determination is based on the direct reaction of simple reducing doses, with potassium ferricyanide in alkaline environment. The reaction is quantitative (complies the Lambert-Beer law). The excess of ferricyanide is measured at 420 nm compared to the blank as the control.

Reagents and equipment required:

- alkaline reagent, 2% of potassium ferricyanide 0.05N in anhydrous sodium carbonate 53%.
- 30% solution of zinc sulphate.
- 15% solution of potassium ferrocyanide.
- 20% NaOH-solution.
- spectrophotometer.

The method applied involves completing the following stages:

- neutralization of the hydrolyzed solutions with NaOH solution until reaching neutral pH;

- removal of components that may interfere with the color reaction with potassium ferricyanide, by treatment with a mixture of $ZnSO_4 / K_4Fe(CN)_4$ using a volume ratio of 3/5;

- Filtration of the precipitate formed after the previous operation;

- Preparing the dilutions;

- Performing the color reaction by treating a 2 ml sample with 5 ml of color reagent (alkaline reagent of potassium ferricyanide).

By reporting the monosaccharide concentration expressed as g/100ml to the amount of substrate and to the of dry matter content of the solid material, can be obtained the expression of the concentration in g/100g of solid.

Determination of ethylic alcohol is based on the quantitative reaction of oxidation of ethanol to acetic acid using an excess of oxidizing agent- $K_2Cr_2O_7$ in acid environment. The excess of potassium dichromate which is not included in the oxidation reaction is spectrophotometrically dosed at 590nm. The calculation of the concentration of ethanol in the sample is carried out using a calibration curve determined from absolute ethanol.

Determination of dry mass - was performed by specific treatment of the sample (4500rpm centrifugation for 20 min and washing with distilled water), quantitative prelevation of the biomass and drying at 105°C until reaching constant weight. Calculation of biomass concentration, expressed in dry substance grams takes into account the sample volume after reaching the constant mass. Expression is in g/100 ml medium.

Determination of total nitrogen, respectively of the protein, was performed by the Kjeldhall method [9].

The wet biomass was determined by centrifugation at 4500 rpm for 20 min., washing with distilled water, weighing the sample after the processing and reporting to 100 ml sample.

RESULTS AND DISCUSSIONS

The present study aimed to obtain feed protein by mixed cultivation of a strain of alcoholic fermentation yeast and a strain of biosynthesis protein that consume the released ethanol as the sole source of carbon and energy. An exact quantity of 1 kg of marc was washed with 2 liters of tap water brought to pH 2-3, at a temperature of 70 °C. For the first stage the diffusion lasted for 15 minutes, yielding the diffusion solution A₁ with 3.9 g sugars /100 ml. The diffusion was repeated by using the same parameters, but changing the diffusion time to 30 minutes. The solution obtained was denoted with A₂, containing 3.5g sugars /100 ml. The diffusion solution obtained by mixing A₁ and A₂ was evaluated from chemical point of view, running determinations of total sugars, total nitrogen, and respectively protein, P, K, Ca and Mg. Knowing the volume of the diffusion solution we could calculate the extraction efficiency, total sugars per 100g marc.

Both A₁ and A₂ washing water, combined, filtered and centrifuged, adjusted to pH 4.0, were distributed in 750 ml Erlenmeyer flask, 150 ml per bottle and sterilized at 0.9 atm., 20 minutes. These were further used as culture medium for alcoholic fermentation.

The flasks with 150 ml diffusion solution were inoculated with a 48 hours old yeast culture of *Saccharomiccs ellipsoideus* placed on the shaker at the minimum mixing speed, at a temperature of 28 °C.

The progress of the alcoholic fermentation was monitored by determination of the following parameters: total sugars, alcohol and OD at 0h, 16 h and 24 h of fermentation. The results obtained for these analyzes are summarized in Table 1.

Table 1. Evolution of the alcoholic fermentation in the marc washing solution (experiment I)

Sample	DO λ=600nm	Total sugars (g/100ml)	Alcohol (g/100ml)	pH
0 h	1.35	3.57	-	4.0
16 h	4.575	1.048	1.82	3.5
24 h	4.890	0.13	2.57	3.5

From the data presented in Table 1 it can be observed that the alcoholic fermentation was

quite fast, in 24 hours consuming virtually all the sugar in medium. The amount of 0.13 g sugars/100ml left in the medium can be represented by pentoses which are not fermented by yeasts.

After 24 h of alcoholic fermentation it was started the protein biosynthesis using a 48 h old strain of *Candida robusta*, at an inoculation ratio of 5%. The medium from each fermentation flask was supplemented with (NH₄)₂SO₄ 0.3 g/100 ml considering that other mineral elements such as , K, Ca, Mg, which are absolutely necessary for yeast growth, are already present in the composition of diffusion solution.

Knowing the needs of microorganisms in terms of growth factors, our objective was to study the way that the protein biosynthesis is stimulated by the yeast strain *Candida robusta* by supplementing the culture medium with growth factors originating from wine yeast autolysate.

The wine yeast autolysate was obtained by physico-chemical treatment of the mash (remaining after yeast distillation and used for alcohol recovery) for breaking the cell wall and release of cell contents. The material obtained was centrifuged, and in the supernatant was separated a protein component that was characterized from biochemical point of view, making exact determinations of the following parameters: total nitrogen = 5.4 g/100 d.s., total protein = 33.75 g/100 d.s. and dry substance = 13.70%.

This protein extract served as the source of organic nitrogen and growth factors in all our experiments on biosynthesis protein both for yeast and lactic acid bacteria.

In the vials containing fermentation medium were added varying amounts of protein extracts, thus obtaining the following variants taken into study:

M = control, with no added protein;

3= 5 ml protein extract /100 ml medium;

2= 10 ml protein extract /100 ml medium;

3= 20 ml protein extract /100 ml medium;

4= 30 ml protein extract /100 ml medium;

The Erlenmeyer flasks containing fermentation medium supplemented with ammonium sulfate and with various

concentrations of protein extract were placed on the "back and forth" shaker at a temperature of 30 °C.

The shaker agitation speed was increased to a maximum in order to ensure proper aeration. Protein biosynthesis duration was 40 h. The evolution of the culture was realized by determinations of the OD at exact time intervals as follows: at 0h, 16h, 20h, 24h, 40h. The alcohol concentration was determined at the beginning and at the end of the biosynthesis. In the final samples was determined the dry substance relative to 100ml medium, thus being able to calculate the efficiency of the bioprocess respectively d.s.g/100 g alcohol consumed.

The results obtained in this experiment are presented in Table 2a.

Table 2a. Evolution of protein biosynthesis by *Candida robusta* yeast on fermented diffusion solution - experiment I, OD evolution at $\lambda = 600\text{nm}$

Sample	0h	16h	20h	24h	40h
M	3.500	5.43	6.061	7.502	7.815
1	4.475	6.19	6.765	8.327	9.675
2	4.875	1.39	7.359	8.096	8.915
3	4.475	5.80	6.677	8.283	9.075
4	4.100	5.79	6.544	8.106	9.605

Table 2b. The evolution of the protein biosynthesis by *Candida robusta* yeast on fermented diffusion solution (experiment I)

Sample		M	1	2	3	4
0h	alcohol (g/100 ml)	2.57	2.57	2.57	2.57	2.57
	alcohol (g/100 ml)	0.16	0.13	0.11	0.13	0.13
40h	wet biomass (g/100 ml)	2.01	2.45	2.35	2.54	2.93
	s.u. (g/100 ml)	2.39	3.11	3.84	4.88	5.31
	efficiency (d.m. g / g consumed alcohol)	0.98	1.27	1.57	2.00	2.17
	protein (g/100 s.u)	41.3	41.1	43.8	41.5	43.6

Analyzing the data provided in the table it can be observed that after 16h of biosynthesis is produced a slow increase in the OD of the culture. This led to the conclusion that due to high concentrations of alcohol in the medium (2.57 g/100ml), the yeasts underwent inhibition, following a very long lag period. Afterwards the OD systematically increased until 40h when the OD value increased over 9

to all four samples containing protein, while the control had a OD value of only 7,815.

The amount of unconsumed alcohol remaining in all samples was very small, being between 0.11 and 0.13 g/100ml. The control had 0.16 g/100ml unused alcohol.

Comparing the values obtained from wet biomass (g/100 ml) we find that in all samples with added protein extract were recorded higher amounts than for the control (2.01 g/100ml). The highest value was achieved in the case of sample 4 (2.93 g/100 ml), representing an increase of 46.5% compared to control.

More significant results were recorded for the dry substance of the culture medium at the end of the biosynthesis. From the data presented in the table it can be observed a progressive increase from sample 1 to sample 4 which recorded a maximum of 5.31 g/100 ml. These progressive increases of the dry matter, together with the small amount (2.39 g/100 ml) obtained for the control, can only be interpreted as a positive response of stimulation of the protein biosynthesis - due to the differentiated addition of protein extract, respectively: 5, 10, 20 and 30 ml of protein extract. Valuable results were obtained in terms of efficiency of the biosynthesis (d.m.g. / g alcohol consumed) that can be observed from the progressively increasing values from 1.27 (sample 1) to 2.17 (sample 4) compared to the control, 0.98 d.m.g / g consumed alcohol, which is explained again by the stimulating effect of the addition of protein extract.

The following experiment was conducted, in terms of alcoholic fermentation, working on the same protocol as the previous one. The Erlenmeyer flask containing 150 ml of diffusion solution were inoculated with a culture of 48 hours old of *Saccharomyces ellipsoideus* yeast, inoculation ratio of 5%. The vials were placed on the shaker with minimum agitation at a temperature of 28 °C. The evaluation of the alcoholic fermentation progress was done by determination of total sugars, alcohol content and OD at 0h and 24h. The results obtained from these analyzes are summarized in Table 3.

Table 3. Evolution of the alcoholic fermentation in the marc washing solution (experiment II)

Sample	DO $\lambda=600\text{nm}$	Total Sugars (g/100 ml)	Alcohol (g/100ml)	pH
0h	1.28	3.57	-	4.0
24h	4.61	0.39	2.01	3.5

By comparing the data in Table 4 with the data contained in Table 2 on the evolution of alcoholic fermentation in the first experiment, can be observed that the values recorded for the OD, final sugars and alcohol are fairly close, the amount of unfermented sugars left being slightly larger (0.39 g/100 ml) compared to the previous experiment (0.13 g/100 ml).

Considering that in the previous experiment due to excessive alcohol concentration at the beginning of the protein biosynthesis the culture had a very long lag period, this time we proceeded to diluting the fermented solution.

The culture media for the protein biosynthesis was prepared by mixing 25ml of fermented solution and 75ml distilled water. Therefore, the initial alcoholic concentration in the medium was 0.5 g/100 ml.

The medium was supplemented with ammonium sulphate 0.3 g% and protein extract, this time in smaller quantities, achieving the following working variants:

M = control, with no added protein;

1= 2.5 ml protein extract /100ml medium;

2= 5 ml protein extract /100ml medium;

3= 7.5 ml protein extract /100ml medium;

4= 10 ml protein extract /100ml medium.

The fermentation media which were supplemented with ammonium sulfate and protein extract were inoculated with a strain of 48h old *Candida robusta*, at an inoculation ratio of 5%.

The protein biosynthesis occurred at 30 °C on the "back and forth" shaker with high agitation speed in order to ensure the proper aeration. The duration time of the biosynthesis was set to 48h. At 27h after the cultivation in all of the vials was added a portion of 50 ml of fermented and diluted medium (25ml medium + 25ml distilled water).

The evolution of the culture was monitored by measurements of the OD at 0h, 20h, 27h, 27h, after supplementation, 44h and 48h.

There were also observed the determinations of the alcohol concentration at the beginning and at the end of the biosynthesis process, also. In the final samples it was determined the wet biomass, the dry substance reported to 100 ml of medium, thus being able to calculate the efficiency of the bioprocess expressed as g D.M. / g consumed alcohol.

The values of these determinations are presented in Table 4.

Table 4a. Evolution of protein biosynthesis by *Candida robusta* yeast on fermented diffusion solution - experiment II, OD evolution at $\lambda = 600\text{nm}$

	0h	20h	27h	27h*	44h	48h
M	2.15	5.11	6.32	4.82	4.48	4.85
1	2.83	5.93	7.11	5.53	5.31	5.58
2	2.59	6.75	7.82	5.67	5.60	5.96
3	3.02	6.42	7.60	5.86	5.92	6.03
4	2.97	6.40	7.59	5.11	4.82	5.27

*27 h after supplementation with fermented medium

Table 4b. Evolution of protein biosynthesis by *Candida robusta* yeast on fermented diffusion solution - experiment II

Sample		M	1	2	3	4
0h	alcohol (g%ml)	0.5	0.5	0.5	0.5	0.5
	sugars (g%ml)	0.1	0.1	0.1	0.1	0.1
48h	alcohol (g%ml)	0.16	0.13	0.10	0.13	0.15
	sugars (g%ml)	0.018	0.013	0.015	0.019	0.013
	wet biomass (g/% ml)	1.62	1.72	1.93	1.70	1.71
	s.u. (g%ml)	0.82	0.95	1.28	1.25	1.23
	efficiency (g s.u. /g consumed alcohol)	0.98	1.13	1.42	1.43	1.45
	protein (g %s.u)	40.9	41.0	43.2	42.8	42.6

Analysing the data given in the table, it can be seen that at 20h biosynthesis the OD of the culture practically doubled. The increase of the OD at 27h is practically no longer significative. After adding the fermented medium the values of the OD decreased, remaining practically unchanged until the end biosynthesis at 48h.

All samples with added protein extract recorded higher values of OD than the control

sample. Lower values of OD achieved in this experiment can be explained by the fact that by diluting the fermented solution to 1:3 intended for the decreasing of the alcohol concentration, it strongly decreased the mineral ingredients existing in the fermented diffusion solution, probably insufficient to achieve a normal growth of the culture. Actually this is reflected in the values obtained from wet biomass and dry substance /100ml medium values well below those achieved in the previous experiment.

The efficiency of the process was also lower. The only value that as constant was the efficiency of the control 0.98 d.m.g./ g.alcohol consumed, this value being still lower than the ones obtained for the four samples containing added protein extract.

Therefore, it was found that diluting the fermented solution in order to achieve an optimal concentration of alcohol decreases also the quantity of mineral constituents of the diffusion solution, and thus the biosynthesis cannot take place in optimal conditions.

CONCLUSIONS

Reducing the alcohol concentration resulted in shortening the lag period, but the increase was not significant.

By supplementing the medium after 27h with a portion of the fermented solution there were no changes in OD.

The result of the experiment was lower values of OD, as well as those for the wet and dry biomass. This could be explained by the fact that by diluting fermented solution, by a 1:3 ratio, in order to decrease the alcohol concentration, decreased considerably the other minerals constituent of the fermented solution. This concentration of minerals was probably not enough to for a normal growth of the culture.

The efficiency of the process above 1.0 are good, but the process must be optimized to increase the amount of wet biomass that is actually the "harvest" of this biosynthesis process.

REFERENCES

- [1] Bustamante, M.A., Moral, R., Paredes, C, Perez-Espinosa, A., Moreno-Caselles, J., Perez-Murcia, M.D., 2008, Agrochemical characterisation of the solid by-products and residues from the winery and distillery industry. *Waste Manag*, 28:372-380;
- [2] Gollücke, A.P., 2010, Recent applications of grape polyphenols in foods, beverages and supplements, *Recent Pat Food Nutr Agric*. Jun; 2(2):105-109;
- [3] Ferrer, J., Páez, G., Mármol, Z., Ramones, E., Chandler, C., Marín, M., Ferrer, A., 2001, Agronomic use of biotechnologically processed grape wastes *Bioresource Technology*, Volume 76, Issue 1, p. 39–44;
- [4] Paradelo, R, Moldes, A.B., Barral, M.T., 2011, Carbon and nitrogen mineralization in a vineyard soil amended with grape marc vermicompost. *Waste Manag Res*. 29(11), p. 1177-84. doi: 10.1177/0734242X10380117. Epub 2010 Sep 13;
- [5] Rodinao Steliana, Butu, M., Golea Diana, Butu Adina, 2011, Qualitative evaluation of fresh marc - raw material with valuable composition, *Banat's Journal of Biotechnology*, ISSN 2068-4673 (Print), ISSN 2068-4738 (CDROM), vol 4, 18-27;
- [6] Deng, Q., Penner, M.H., Zhao, Y., 2011, Chemical composition of dietary fiber and polyphenols of five different varieties of wine grape pomace skins. *Food Research International*, 44, p.2712–2720;
- [7] Butu Alina, Butu M., Rodino Steliana, 2011, Studies on the possibility to recover the by-products resulted from the vinification process, *Banat's Journal of Biotechnology*, ISSN 2068-4673 (Print), ISSN 2068-4738 (CDROM), vol 3, 56-63;
- [8] Aceituno Felipe F., Orellana Marcelo, Torres Jorge, Mendoza Sebastián, Slater Alex W., Melo, Francisco Agosin Eduardo, 2012, Oxygen response of the wine yeast *Saccharomyces Cerevisiae* EC1118 grown under carbon-sufficient, nitrogen-limited enological conditions, *Appl Environ Microbiol*. 78(23): p.8340–8352;
- [9] Jung S., Rickert D. A., Deak N. A. Aldin E. D, Recknor J., Johnson L. A, Murphy P. A., 2003, Comparison of Kjeldahl and Dumas methods for determining protein contents of soybean products. *Journal of the American Oil Chemists' Society*., Volume 80, Issue 12, p 1169-1173.

EMPIRICAL ANALYSIS OF INTERRELATIONSHIPS AMONG GROWTH IN AGRICULTURAL SECTOR, POVERTY AND INEQUALITY IN PAKISTAN

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Abstract

The purpose of this study is to analyze the relationship between growth in agricultural sector and poverty in Pakistan. It explores that how much the poor people have gained from growth in agricultural sector of Pakistan by considering growth magnitude and benefits obtained by the poor people resulting from growth for the period of 1985 to 2005 through applying OLS Regression Technique. The results indicate that the variable of growth in agricultural sector is significantly and negatively associated with the variable of poverty, i.e., the growth in agricultural sector of Pakistan will result in reducing the level of poverty in Pakistan.

Key words: growth in agricultural sector, Pakistan, poverty

INTRODUCTION

The link between poverty and growth has been a mooted issue. At one side, the growth is being regarded a fundamental element for reducing poverty (World Development Report, 1990), with prerequisites of social services, health and education access. At other side, it is being realized that relationships of inequality, poverty and growth complex and non-linear. Kuznets (1955) found growth and inequality have inverted U shaped association, which describes that in the beginning, inequality will rise with growth, whereas, it will decrease at excessive growth level since growth benefits reaches to the people with low income.

The methods originated by Kanbur (2002) and Kakwani (1993) provided elasticity information for the shorter time periods but did not explain elasticity in long-term time period of inequality, poverty and growth. Datt and Ravallion (1992) provided better technique because it did not rely on only assumptions of statistics and but it also provided elasticity information for shorter time period by depending on two or very few surveys. Dollar and Kraay (2001) were of the

opinion that growth of economy offers same benefits for the poor people as for the overall economy. Knowles (2001) also discovers that inequality negatively and significantly impact growth. Foster and Szekely (2000) suggested that elasticity's positive value shows that growth is good for the poor. Therefore, it is being suggested that for achieving swift poverty cutback, the Poverty Equivalent Growth Rate (PEGR) needs to be expanded instead of just achieving normal growth (Kakwani and Son 2004).

The rural poor people can be classified according to agricultural land access: the cultivators have land access being smaller tenants and landowners, and being landless and unskilled laborers. The people who do not cultivate may be among the poorest people in rural poor (Khan 1998). Saboor (2004) determined trend analysis for income inequality and rural poverty through axiomatic technique for assessing influence of several variables on Pakistan's household poverty status, for developing PEGR to analyze the influence of agricultural growth on rural poor and for forecasting co-integrated movement of inequality, poverty and agricultural growth.

There are very few studies which explored the association of poverty level and growth rate in agricultural sector of Pakistan. Therefore, the objective of this study is to investigate the relationship between poverty and agricultural growth in Pakistan for the period of 1985 to 2005 through applying OLS Regression Technique.

Rest of study has been arranged as follows: the materials and methods has been presented in Section 2, the results have been described in section 3, whereas, the last section describes the concluding part.

MATERIALS AND METHODS

The data for the period of year 1985 to year 2005 has been collected form Pakistan's Economic Surveys and United Nations Statistical Division Database. The OLS regression model has been applied in order to determine relationship of growth in agricultural sector and poverty level in Pakistan. The objective of this study is to explore the relationship of agricultural sector's growth and level of poverty in Pakistan through applying OLS regression model.

The regression model which has been estimated is as follows:

$$\text{Poverty Level} = \beta_0 + \beta_1 \text{GDP} + U_t$$

where:

Poverty Level = Poverty headcount ratio expressed as percentage

GDP = Real GDP growth rate expressed as percentage

U_t = Representing error term

SPSS 16 software has been used for data analysis.

RESULTS AND DISCUSSIONS

The regression results have been estimated through OLS regression technique and the results have been presented in table 1, 2 and 3. The results of table 1 have shown that the value of adjusted R square is 0.816 which indicate that the independent variable which has been used in this model have explained

around 81.8 % of the variations occurring in poverty level of Pakistan.

The value of Durbin Watson statistics is 1.614, which indicates that there is no problem of multi-collinearity as the value is within acceptable range of 1.5-2.5 (Table 1).

Table 1. Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.908a	.824	.816	5.00346	1.614

a. Predictors: (Constant), GDP growth rate

b. Dependent variable: Poverty level

The results of table 2 show that P-Value is 0.000, which describes that the overall model is significant to explain level of Poverty in Pakistan and the mathematical form of the model is correct. The results of Table 3 describes that the variable of growth rate is negatively and significantly associated with poverty level in Pakistan. It means that if the value of real GDP growth rate will increase, it will cause the poverty level to decrease.

Table 2. ANOVA^b

Model	Sum of Squares	df	Mean square	F	Sig.
Regression	2351.530	1	2351.530	93.931	.000a
Residual	500.692	20	25.035		
Total	2852.222	21			

a. Predictors: (Constant), GDP growth rate

b. Dependent variable: Poverty level

Table 3. Coefficients^a

Model	Unstandardized coefficients		Standardized coefficients	t	Sig.
	B	Std. Error			
Constant	96.337	2.175		44.302	.000
GDP growth	-.391	.040	-.908	-9.692	.000

a. Dependent variable: Poverty level

CONCLUSIONS

Sustainable and fast growth in agriculture can perform a significant function to achieve

poverty reduction. This study recommends that growth in agricultural is indispensable for achieving reduction of poverty. This study has determined the relationship of real growth rate of GDP in agricultural sector and level of poverty in Pakistan for the period of 1985 to 2005 through applying Ordinary Least Squares (OLS) Regression Technique. The results have shown that the growth of agricultural sector can result to decrease the level of poverty in Pakistan. The government should focus on agricultural sector growth in order to decrease the poverty level in Pakistan.

REFERENCES

- [1]Amjad, R., Kemal, A.R., 1997, Macroeconomic Policies and Their Impact on Poverty Alleviation in Pakistan, *The Pakistan Development Review*, 36 (1): 39–68.
- [1]Anwar, T., 2005, Long-Term Changes in Income Distribution in Pakistan: Evidence Based on Consistent Series of Estimates. Islamabad: Centre for Research on Poverty Reduction and Income Distribution. (Discussion Paper Series No. 03).
- [3]Anwar, T., 2006, Changes in Inequality of Consumption and Opportunities in Pakistan during 2001/02 and 2004/05. Islamabad: Centre for Research on Poverty Reduction and Income Distribution (CRPRID).
- [4]Datt, G., Ravallion, M., 1992. Growth and Redistribution Component of Changes in Poverty Measures: A decomposition with application to Brazil and India in the 1980s, *Journal of Development Economics*, 38 (2): 275–95.
- [5]Dollar, D., Kraay, A., 2001, Growth is Good for the Poor. Policy Research Working Paper 2587:50, Washington, DC, World Bank.
- [6]Foster, J., Szekely, M., 2000, How Good is Growth?, *Asian Development Review*, 18 (2): 59–73.
- [7]Government of Pakistan. 2005. Economic Survey 2004–05. Islamabad: Finance Division, Economic Advisor's Wing.
- [8]Kakwani, N., 1993, On a Class of Poverty Measures', *Econometrica*, 48 (2): 437–46.
- [9]Kakwani, N., Pernia, E., 2000, What is Pro-poor Growth, *Asian Development Review*, 16 (1): 1–22
- [10]Kakwani, N., Son, H.H., 2004, Pro-Poor Growth: Concepts and Measurement'. PIDE, 19th Annual Conference, 13–15 January, Islamabad.
- [11]Kanbur, R., 2002, Conceptual Challenges in Poverty and Inequality: One Development Economist's Perceptive'. Working Paper 2002–09, Department of Applied Economics and Management, Cornell University.
- [12]Knowles, S., 2001, Inequality and Economic Growth: The Empirical Relationship Reconsidered in the Light of Comparable Data. Paper for UNU/Wider Development Conference on Growth and Poverty, Helsinki, World Institute for Development Economic Research (WIDER).
- [13]Kuznets, S., 1955, Economic Growth and Income Inequality, *American Economic Review*, 45 (March): 1–28.
- [14]Ravallion, M., Chen, S., 2003, Measuring Pro-Poor Growth, *Economic Letters*, 78 (1): 93–99.
- [15]Saboor, A., 2004, Agricultural Growth, Rural Poverty and Income Inequality in Pakistan: A Time Series Analysis. Ph.D. thesis, University of Agriculture, Faisalabad.
- World Bank. 1990. *World Development Report: Poverty*. New York: Oxford University Press.

STUDY CONSIDERING THE ENVIRONMENTAL PROTECTION AND LIFE QUALITY IN ROMANIA IN THE CONTEXT OF SUSTAINABLE DEVELOPMENT

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Abstract

The environmental protection represents an important subject in international debates, being accentuated by the alert rhythm of economic development and the higher demands of the current consumer generations. In general, it can be claimed that the most developed countries are producing the largest quantities of waste and pollutants and are consuming large quantities of energy and natural resources. The impact these countries have upon the natural environment is strong and destructive. Therefore, it can be remarked that the industrialization level is inversely proportional with the environmental state, which is getting worse by the year: reduced timbered areas, agricultural soil degradation, a thinner ozone layer, numerous extinct plant and animal species, accentuated greenhouse effect, etc. Affecting the natural environment has severe repercussions upon the quality of life, manifesting itself through water, soil and atmospheric pollution. These are the reasons why the authors of this paper are analysing, in the present study, the problems concerning the environmental protection and life quality.

Key words: agriculture, analysis, animals, plants, products, western region

INTRODUCTION

The environmental issues have long surpassed the local, regional and national dimension, becoming one of the most important wide range global strategies. Due to the impact upon the human and animal health and the mutations upon the natural and anthropic environment, the ample projects of development and rural improvement and the social and economical projects with a direct effect upon the ecosystem must be rigorously examined in order to fulfil the environmental standards. [1]

The quality of life is desired for both the generations living in present times and the future ones. The future generations have the right to a clean environment, and we are obliged to ensure this. This desideratum is stipulated in the statements of all grand summits that have been organized at a global level, as well as in Agenda 21, a document that represents a guide of conceptual

implementation, univocally accepted, respectively the concept of durable development, which has been defined, developed and officially accepted at a global level in 1992, at the Rio de Janeiro summit. This document enhances the requirement of a capacity to satisfy the “needs” of the current generation, without compromising the chance future generations have to satisfy their own needs. [4]

The crucial element in the economic and social development of the European Union, including the priorities concerning its strategies and policies (PAC, The Cohesion Policy) is the European Council in Lisbon in March 2000 where the *Lisbon Strategy* was launched. [2]

Also known as the Lisbon Agenda, the Lisbon Strategy represents the plan of action adopted by the EU member states in 2000 aiming at turning European economy into “*the most dynamic and competitive economy in the world based on knowledge, capable of*

sustainable development, providing with more and better jobs, with a greater social cohesion and that respects the environment” by 2010. [10]

Through this strategy, they have identified *five key domains* in which applying reforms is necessary: *the society of knowledge, the domestic market, the business environment, the labour market and the protection of the environment.* [3]

The *sustainable development strategy*, also known as the *Göteborg Strategy*, is considered the “environmental dimension” of the Lisbon Strategy; its priorities are climate changes, transportation systems, public health and the responsible management of natural resources. [6]

The Sustainable Development Strategy (SDS) is a coherent strategy concerning the way in which the EU understands to contribute to the observance of the principle of sustainable development and it aims at identifying and acting in order to improve life quality continuously through the development of sustainable communities capable of managing and using effectively the available resources and to valorise the social and environmental potential thus ensuring prosperity, environmental protection, and social cohesion [9]. The *three dimensions of sustainable development (economic, social, and environmental)* started to develop as a new concept resulting in deep changes of the present way of living. They aim at making the three coordinates of sustainable development play a balanced role (with similar impacts) on the performance of the economic actors, with performance and profit having their sources in each of these domains.

The strategic directions of the SDS are:

- Controlling climate change;
- Ensuring sustainable transportation;
- Controlling the threats on public health such as chemical pollution, unsafety of foods, infectious diseases;
- Managing responsibly natural resources and stopping, as much as possible, the decline of biodiversity;
- Controlling poverty and social exclusion;
- Challenging population ageing.

The European Commission is developing, based on the contribution of the EU member states, a new Sustainable Development Strategy.

Romania has also developed, in 1997, its National Sustainable Development Strategy (NSDS) based on the document resulted from the world summit in ion (1992), a strategy that was revised in 2008. [8]

The National Sustainable Development Strategy (NSDS) reflects a coherent vision on the future of Romania in the following decades through the prism of the generous and realistic concept of sustainable development. Thus, short-, medium- and long-term strategic objectives are:

-Horizon 2013: Incorporating organically the principles and practices of sustainable development in the ensemble of public programmes and policies of Romania as a EU member state;

-Horizon 2020: Reaching the mean level indicated by the figures of 2006 of the EU-27 according to quality indices of sustainable development;

-Horizon 2030: Making Romania get as close as possible to the mean level of the year of the EU member states from the point of view of sustainable development indices.

The Main directions of the NSDS are:

-correlating rationally the development objectives, including investment programmes in the inter-sectorial and regional fields, with the potential and capacity of sustaining natural capital;

- modernising at a quick pace the systems of education and professional training, public health and social services taking into account the demographic development and their impact on the labour market;

-using widely the best existing technologies from an economic and ecologic point of view when making investment decisions;

- introducing eco-effectiveness criteria in all production and services activities;

-anticipating the effects of climate changes and developing a plan of measures for crisis situations generated by natural or man-made causes;

-ensuring food security and safety by valorising the comparative advantages of Romania without ignoring the exigencies concerning the maintenance of soil fertility, the conservation of biodiversity and the protection of the environment;

-identifying supplementary sources of financing for the achievement of great projects and programmes, particularly in the fields of infrastructure, energy, environmental protection, food safety, education, health, and social services;

- protecting and valorising the cultural and natural national heritage;

-connecting to the European norms and standards concerning life quality.

MATERIALS AND METHODS

The authors of the study consider that protecting the environmental frame and the landscape must comprise a series of components of the rural space conservation, from which the following are reminded:

The initiators, the designers and the executors of rural development and enhancement projects, the local authorities must ensure the rational and durable exploitation of local resources, such as forests, plantations, protection curtains, natural grasslands, waters, quarries;

Renovation projects of rural localities, constructions, palaces, castles and mansions and some elements of traditional techniques (wind and water mills, workshops and factories for archaic manufacturing of agricultural products) must add value to the local architecture, to conserve its specificity and to recreate some components of the traditional material culture, that, from various reasons, have suffered from degradation or destruction;

Protection programmes for water, natural parks and reservations of a local or national interest;

Programmes for depositing and recycling waste must be based on the principle according to which each area, locality or urban/rural region must carry responsibility for the waste, pollutants and pollution

emissions they produce. **The rural areas must not be considered a place for dumping urban waste or recycling it.**

Developing entrepreneurial activities in rural areas and not only causes, many times, negative effects on the environment.

The phenomenon of occurrence of environmental damaging factors and of ecologic unbalances is called pollution.

The causes of environmental pollution are:

-Uncontrolled use of natural reserves;

-Storage of wastes in the environment;

-Production of new goods in which the pace of consumption and recycling is inferior to the occurrence pace;

-Rapid population growth, particularly in the two centuries;

-Intensification of industry, transportation, and agriculture in the last decades;

-Appearance of overpopulated areas.

1. Air as Environmental Factor

Air is continuously polluted particularly in areas close to industrial units that use old technologies and cannot rely on proper equipment of removing polluting emissions.

Table 1. Main pollutants in Romania and the EU (kg/inhabitant/year)

Pollutants (kg/inhabitant/year)	SO _x	NO _x	CO	CO ₂	CH ₄	N ₂ O	SOVM	NH ₃	C
Specific emissions (Romania, 1994)	40	14	106	5.400	67	4,6	28	10	1472
Specific emissions (EU 12,1990)	36	37	137	8.822	61	3	38	12	2.300

Source: Report on Rural Development in Romania, vol. 2, 1998, PHARE Project

Overall, annual mean emissions in Romania per inhabitant are close to European means; in certain substances (CO₂), they are clearly below the mean of the EU countries. This is due to the reduction of economic activities after 1989 (the closing of industrial compounds and of animal farms) and to the introduction of non-polluting technologies.

2. Water as an Environmental Factor

They discharge annually, in watercourses, about 6.500.000 pollutants among which chlorides, organic substances, ammonia, suspensions, phenols, cyanides, sulphured hydroxide, detergents, and pesticides. The major pollutants are industrial wastes, used

waters, and wastes from animal farms, domestic used waters, etc.

The hydrographic basins with the longest “degraded” watercourses (compared to the total length of the watercourse) are Ialomița, Prahova affluents, Dâmbu), Prut (with Jijia, Bahlui), Mureș-Aranca (Arieș, Târnava Mică, Târnava Mare), Siret (Bârlad, Râmnicu Sărat), Someș (Sasar), and Olt (Cîbin).

Hydrographic basins that include river segments whose water is 3rd grade quality are Olt, Prut, Siret, Argeș, Jiu, Bega-Timiș, Mureș-Aranca, Someș.

The global quality of the river Danube meets STAS 4706/1 quality standards due to the high levels of water flows that ensure proper dilution; there is, yet, a deterioration of the quality because of the discharge of considerable amounts of wastewaters both upstream (Baziaș), and along Romania’s borders, through diffuse pollution by the affluents Olt, Argeș, Ialomița, Siret, Prut; discharge of wastewater that was not treated or that was improperly treated by economic units; wastewater discharged by a series of localities along the Danube (Drobeta-Turnu Severin, Brăila, Galați, Tulcea) that have no wastewater treatment facilities.

3. Soil as an Environmental Factor

The deterioration of the soil quality is constantly increasing because of erosion, acidification, alkanisation, moisture excess, drought, marshing, salting, compacting, chemical pollution by pesticides, heavy metals, fluorides, and oil, that impact soil suitability for different cultures and their ecological function.

About 3,700,000 ha of the 9,500,000 ha of arable land meet sustainable and effective agriculture conditions.

The chemical pollution of the soil affects 900.000 ha of agricultural land and 300.000 of forestlands, and pollution by oil and salt water affects about 50.000 ha. Pollution by storage of wastes affects 11,090,000 ha. Salty lands represent 600.000 ha, land glides represent 700.000 ha, and soil compaction affects 6.500.000 ha. Periodical soil moisture affect 3.800.000 ha of agricultural land and 600.000 forestlands; drought is

present on 7,100,000 ha of agricultural and 200.000 ha of forestlands. Other 320.000 ha are affected by excessive skeleton content in the upper layers and by drainage works.

The most important issue is soil erosion that affects about 700,000 ha of agricultural land with a tendency to expand and intensify. Wind soil erosion on 378,000 ha tends to extend because of deforestation and of lack of windbreaks in the areas most exposed to wind erosion (only 2,200,000 ha are protected by such windbreaks so far).

Degraded and combined lands because of industrial or otherwise activities are another important issue. Such lands can no longer be used unless proper treatments are applied. Contaminated lands are represented by any type of land that is so damaged because of the substances they contain that there is major risk of water pollution or of other hazardous phenomena.

Agricultural activities are another major cause of water pollution because of the improper waste management and of the use of fertilisers and pesticides. The most affected areas are ground waters. Contamination by nitrites of ground waters is a major environmental issue in Romania. Nitrite concentration can reach between 100 mg/l and 300 mg/l compared to the maximum admitted of 45-50 mg/l.

4. Forests as an Environmental Factor

In Romania, the forests covered, at the end of 2010, an area of 6,515,000 ha, i.e. 30,000 ha more than in 2007 (i.e., 0.5%).

Compared to 2009, the forestland area increased with 0.53%.

Table 2. Wood harvested per main tree species (cubic metres)

Wood species	2007	2008	2009	2010
Total wood harvested	17,238	16,705	16,520	16,992
Evergreens	7,491	6,766	6,635	6,895
Deciduous	5,182	5,208	5,489	5,651
Oak	1,485	1,653	1,403	1,526
different hard wood species	1,668	1,760	1,845	1,770
different soft wood species	1,412	1,318	1,148	1,150

Source: Statistical Brief, Romania in figures, 2011

In 2010, forest area was 6,354,000 ha, with evergreen species covering 1,941,000 ha

(i.e., 30.5%) and deciduous species covering 4,413,000 ha (i.e., 69.5%).

These points to an incipient process of degradation of the forests of Romania because of the deforestations that lead to erosion and aridisation of the hill and mountain slopes.

At present, Romania is considered, according to international criteria, a country with forests moderately affected by pollution.

The area covered with forests in Romania is larger than that of such countries as Albania, Bulgaria, The Czech Republic, Slovakia, Hungary, Austria, Denmark, Greece, Holland and Great Britain.

Forests, together with air, water and soil, are an important factor in environmental protection.

Thus, forests play not only an economic role, but a social role and a protective role also, i.e. they protect biodiversity, local and regional climate, waters, soil, and air. This is why forests are a relevant sub-criterion in the characterisation of the environment. The last years, there has been a constant process of degradation of the forests in Romania because of **massive deforestation** that caused erosion and aridisation of hill and mountain slopes.

Improving environmental quality in Romania largely depends on the increase of forest quality. Thus, we need to take measures to reforest degraded lands, to develop windbreaks in droughty areas and to manage forests properly.

The policy of the European Union in the field of the environmental protection aims at reaching sustainable development through the inclusion of environmental protection among sectorial community policies. Reaching this goal supposes the introduction of some high environmental standards and the observance of a few very important principles, such as:

- “the polluter pays”;
- “the polluter is responsible for the damages produced”;
- controlling pollution at the source and dividing responsibility among all economic operators at local, regional and national levels.

In Romania, awareness of environmental issues increased significantly and they have

taken measures to control these issues after the participation in the Rio Summit in 1992.

Thus, at present, it is well known that the quality of the environment is an important component of economy since it is essential for the quality of the inhabitants’ life.

To reach sustainable development, we need to see environmental protection as a component of the development process and not as an isolated element.

CONCLUSIONS

In the author’s opinion, protecting the environment in rural areas cannot be resumed to a few principles and should not be handled only by NGOs and local or regional organizations.

The environmental protection must be integrated in a global ecological strategy that embraces a stable and unitary legislative frame, at a regional and European level.

Protecting the environment, as a practical activity on the field, must start from a clear definition of the **environmental policies**. The basic elements of these policies must target the protection of soil, water, air, forests, plantations, farms and habitats, through the delimitation of areas in which the implementation of activities that affect the environment are limited or forbidden. Also, within these environmental policies, it is imposed a permanent and constant international problem, both in the legal domain and the domain of monitoring the environment and of practical co working actions in order to avoid, where it is needed, the limitations and stopping of the negative effects of pollution generating factors.

REFERENCES

- [1]Man, T.E., Mateoc-Sîrb, Nicoleta, 2007, Rural and regional development of the Romanian village, Politehnica Publishing House, Timisoara
- [2]Mateoc-Sîrb, Nicoleta, 2002, Rural and regional development in Romania, Agroprint Publishing House, Timișoara
- [3]Mateoc-Sîrb, Nicoleta, Ungureanu, G., 2010, Regional and rural development. Evolutions and trends. Mirton Publishing House, Timișoara
- [4]Otiman, P. I., Mateoc-Sîrb, Nicoleta, *et al*, 2011, Alternatives of Romania’s rural economy: agriculture

development or food insecurity and rural severe desertification, Romanian Academy Publishing House, Bucharest

[5]Otiman, P.I. *et al.*, 2006, Rural durable development in Romania, Romanian Academy Publishing House, Bucharest

[6]Zahiu, Letiția, Dachin, Anca, 2001, Comparative agro-food policies, Economic Publishing House, Bucharest

[7]Zahiu, Letiția *et al.*, 2005, Agricultural policies and markets-reform and European integration. Ceres, Publishing House, Bucharest

[8] <http://www.apdrp.ro/>

[9]<http://www.madr.ro/pages/teritoriu.php?self=17>

[10]<http://www.madr.ro/pages/page.php?self=03&sub=0302&tz=030202>

STIMULATING INVESTMENT IN MOLDOVAN AGRICULTURE THROUGH SUBSIDIES

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Abstract

Providing sustainable financial services for rural areas and agriculture in developing countries has proven to be difficult. Millions of lei have been spent in Republic of Moldova for subsidizing programs and policies to develop financial institutions to serve this neglected market. But, Moldovan farmers are dissatisfied with the results. Agriculture continues to receive only a small share of total formal credit and that most farmers must rely on savings or informal credit supplies to finance their operating costs and long-term investments. These critics argue for a return to more active government intervention, including the creation of state-owned agricultural development bank.

Key words: *agricultural households, agricultural policy, agricultural sector, banking, donors, economic growth, financial institutions, financial flows, fiscal policy, incentives, investments, private property, subsidies*

INTRODUCTION

Moldova is a landlocked country endowed with rich agricultural resources. Agriculture and agro-processing activities account for about 30 percent of Moldova's gross domestic product (GDP), 40% of employment, and about 60% of the nation's total exports. Agricultural lands cover 74% of the country. Conducting business processes in transition countries require applying various economic methods for stimulus and support of certain sectors of the economy. From a strategic perspective, Moldova needs to nurture agriculture. An effective way to develop the agricultural sector is to promote and support investment and subsidy policies.

In literature, a subsidy is a payment limited in time or in relation to a specific investment or to allow a person, company or organization to cover all or part of its overall costs, or costs of an activity specific.

In all developed countries subsidies are a significant source to covering costs for the manufacture of agricultural production. This support is an important element in stimulating the development of agricultural production.

MATERIALS AND METHODS

As informative sources in the process of investigation that has been made, there have been used some information from Agriculture Ministry and Food Industry, Intervention Agency and Payments for Agriculture, Information of National Bureau of Statistics of Moldova, Financial Ministry and financial reports of other economical- financial structures from the country and abroad. The base methods of research are analyses and synthesis, economical comparison and statistic method.

RESULTS AND DISCUSSIONS

The reforms initiated in the early 90s led to lower agricultural production and destruction of material and technical base. Taking into consideration that 20 years have passed, the situation in the agricultural sector has changed dramatically and still there is a need to expand the plantation of perennial crops, livestock sector development, purchase of tractors, combines and agricultural inventory and equipment the irrigation.

To overcome a low productivity agricultural sector in general needs a lot of investments.

Just only by investing we can transform local agriculture in a modern, highly developed branch of economic activity. With the launch of reforms on the relation of production the state share of investment activity showed decreasing trends with only 2,6 percent at the moment. So basically all the volume of fixed capital investment for agricultural development comes from private investment. In recent years the foreign investment in agriculture remains very small and constituted just 4,4 percent of total investment. More detailed information on the development of investment in agriculture is reflected in Table 1.

Table 1. The information of investments in agriculture

Year s	Total fixed capital investm ent in product iv purpose	From which		Investment in joint ventures and foreign, mil.lei		
		Publ ic inve stme nt	Privat investm ent	Joint venture s, without foreigh capital	Joint venture s with foreigh capital	Fore igh inve stme nt
2008	1031,3	52,3	861,9	14,9	98,1	4,0
2009	908,8	30,4	777,2	2,5	85,1	13,7
2010	1045,6	30,8	812,5	0,9	123,2	28,1
2011	1808,2	47,5	1444,1	3,0	234,6	78,9

Source: It's elaborated by author on the basis of information of National Bureau of Statistics of Moldova

From the analysis on investment activity in the domestic agricultural sector till 1999, we can highlight a clear trend of decrease of the investment volume throughout the period of reformation of agriculture. From the year 2000 onwards has held permanent growth of the volume of investment in the agricultural sector. The level of investment needed for the simple reproduction of fixed assets of productive job was exceeded in 2007 and 2010, agricultural investment being insufficient in the remaining years of the considered period even to maintain the existing levels of agriculture endowment with fixed assets.

In 2007, in Moldova the National Strategy for Sustainable Development of Agro-Industrial Complex was adopted that has set as a goal to ensure sustainable growth of the agribusiness sector, improve the quality of life in rural areas through increased productivity and

competitiveness of the agricultural sector. The funds allocated to fund farming subsidies are distributed to the state budget in line with the concept of farming subsidy system in Moldova. In 2010, Payments and Intervention Agency for Agriculture was created, which performs administration and management of the fund to subsidize farmers. According to the "Regulations on the use of the fund for subsidizing farmers' allocation of subsidies is determined by:

- 1) the need to enhance the competitiveness of Moldovan agricultural domestic and foreign markets ;
- 2) the need to ensure food security of the population of Moldova;
- 3) the need to address the economic, social and ecological problems in the rural environment;
- 4) the requirements and obligations of European integration aspirations.

The allocation of the fund is to achieve the following objectives:

- 1) to increase agricultural productivity and competitiveness ;
- 2) to stimulate technology transfer and extension services ;
- 3) to increase farmers' income and reduce poverty;
- 4) to attract young farmers in the design and development of agricultural activities in the rural sector ;
- 5) to use efficiently natural resources and environmental conservation. [1]

Subsidizing is generally a measure to protect local farmers from international competition.

In Moldova, in 2006 about 40% of subsidies were granted to sugar beet seeds and tobacco. In 2011, most of the grants were awarded to purchase agricultural equipment. During the last years over 80% of the grants have a supporting character. Agriculture must generate more revenue, but this requires investment. Agricultural modernization and tech needs to improve competitiveness of agricultural production. This is important in the context of preparing for conditions to be created with the opening of new markets. For comparison, about 40% of the EU budget is meant for subsidies, in Moldova £ 400 million (less than 2%), so it is difficult to achieve competitiveness. The

average grant in Moldova is 20 euro per hectare in the EU and 400 euro per hectare, so all ideas and proposals are not realistic.

The current system of subsidizing farmers is characterized by the application of the management and allocation of variable budgetary resources, in some cases inefficient, opaque and bureaucratic.

Thus, if in the early stage support areas were limited to stimulate lending to agricultural subsidies and creating technological machinery stations, with an extension, then, starting with 2006, they were extended to tree plantations, support livestock sector, subsidizing agricultural risk insurance, VAT compensation to the achievement of the country's own production and purchasing products of plant protection and fertilizers, subsidies for sugar beet producers and tobacco producers .

However, sources for subsidizing farmers in 2008, focused mostly on investment issues, supplemented by introducing a complex compartment that stimulate investments in the purchase of machinery and equipment for small and medium processing, drying and freezing fruits and vegetables, packing houses and refrigerators - designed to develop competitive advantages of the agricultural sector and its integration into the international trading system.

The results of the subsidy policy trends :

-Increasing new 3 plantations about 18 000 ha, or an increase - about 11 times: from 519 ha in 2001 - to 6100 ha in 2008, with a rejuvenated perspective of them, in an area of 60 000 ha in 2016;

-Recovery of new branches – „nut tree culture” by planting approximately 3100 ha of nut trees;

-Startup and expansion of areas that produce environmentalists - from about 22 000 ha ;

-The economic and financial recovery and revitalization of over 20 agricultural companies and 15 pork production units. Thus, in 2006-2010 to revitalize the livestock sector have been renovated and refurbished 1 cattle breeding farm, two farms pigs, 2 sheep farms, 6 poultry farms, including one incubator; one breeding farm rabbits, 2 modern slaughterhouses;

-Maintaining and restoring genetic resources by offsetting a part of the costs to purchase animals for breeding and artificial insemination;

-Developing rural infrastructure of service delivery to workers that breed animals through the establishment and strengthening of material and technical base of local offices for artificial insemination, milk collection and animals;

-Renovation and modernization of material and technical base of the processing and storage of agricultural production in rural areas, the revitalization and modernization of 25 refrigerators, 4 enterprises of processing fruits / vegetables and three dryers until 2008. With state support through IFAD programs and RISP, until 2010, was funded the development of 33 refrigerators, 8 bakeries, 3 drying fruit, 11 grain processing enterprise, 7 processors of meat, 1 fruits and vegetables processing enterprise ;

-Extending the irrigated areas from 3.4 ha in 2001 - to 23 300 ha - in 2008. In 2013 will be allocated 102 million\$ for rehabilitation of 11 irrigation systems that will provide water about 1,260 hectares of agricultural land in Moldova.

For the first time, a new measure was instituted pertaining to stimulate lending and compensation of interest on loans obtained for use in agriculture . Thus in 2011 there have been attracted investments in agriculture worth 1.526 million lei, subsidized with 214 million. Subsidies, currently represents 13% of total investment.

The priority measures of policy implementation for authorities from the agribusiness sector in 2013 are protected field crops, perennial plantings, upgrading and renovating farms, purchase of breeding animals and post-harvesting and processing infrastructure .

Although there are enough problems, both the state and farmers continue to develop the agricultural sector. Thus, in 2012 a record investment in the agribusiness sector was attracted, £ 4.6 billion, 1.6 billion or about 30 % more than in 2011.

The news of the Regulation concerning measures to subsidize investments in agribusiness sector for 2013 are actions to increase the priority directions of the authorities. Consequently, within the measure of subsidization, agricultural credit loans with an interest rate of 14 % will be fully subsidized, as subsidies were far smaller than the amount of interest. Another change concerns the extent to

stimulate establishment of perennial plantations, which means that the subsidy density apple tree orchards from 700 to 1200 per hectare subsidies will still be 10 thousand lei per hectare (\approx €600). Also, investments in growing vegetables on protected areas will receive additional support because of the small number of applications for this position from the start being allocated grants covering 50% of the investment. In the case of irrigation subsidies will cover other expenses related to the pipe supplying water system and the film covering water storage basin. The grants awarded this year of 50% for cattle breeding farms extend to materials manufacturing and design works of such farms. Tripled the amount of subsidy for the purchase of breeding sheep and goats to 100 lei per kilo (\approx €), which allows payback of 100%.

One of the additional measures introduced in 2013 stipulates subsidized land consolidation in which they will be compensated at the rate of 50% of the costs incurred to authenticate transactions of sale, donation or exchange and registration in the Land Register of farmland. To qualify for this support, farmers have to consolidate three parcels regardless of the surface. The last measure includes subsidies to boost agricultural irrigation. Energy costs used to pump water through centralized systems will be subsidized by 50-80% and the costs incurred for oil and gasoline used to pump water, grants of money allocated being 50 (\approx 0,03 €) per cubic meter of water.

Young farmers can receive subsidies increased by 10% for investment measures in agroindustrial sector. Subsidies will not be distributed in installments of 75% and 25%, this year being allocated grants in amounts of 100%.

CONCLUSIONS

Moldova has very limited resources to subsidize the agricultural sector in the near future is unlikely to reach the limit stipulated by the WTO for our country. In this context the problem of effective use of budget appears and it is unlikely to use subsidized models that work in the European Union.

For the Republic of Moldova the experience of countries in transition is more attractive, in

particular to subsidize bank loans for agriculture. In Moldova there can be used a system of subsidies with greater focus and more transparent, represented by supplementary grant to the amount of the credit.

To say it otherwise, it is necessary that agricultural subsidies be allocated to viable farms, be acceptable in terms of tax legislation and transparency, minimize deviations and be strictly oriented towards favoring activities in post-privatization restructuring.

In parallel with direct subsidies, the government should use the so-called "green subsidies", which show essentially public funds for peasants' farms. Implementation of these goals can be achieved by attracting international technical assistance.

REFERENCES

- [1] Decision on approval of the distribution of the fund subsidy to farmers for 2011, 2012 and 2013 no.152 of 02/26/2013, Official Gazette of 27.02.2013 nr.41/184 <http://www.aipa.md/>
- [2] Government Decision no. 282 of 11.03.2008, on the approval of the National Strategy for Sustainable Development of the Agroindustrial complex of the Republic of Moldova (2008-2015), Official Gazette no. 57-60 of 21.03.2008;
- [3] Government Decision no. 624 of 12.07.2010 regarding the approval of amendments and completions to certain governmental decisions, Official Gazette no. 121-123 of 16.07.2010
- [4] Sargo A., Subsidies-instrument to stimulate growth of the agricultural sector, Scientific Papers of the National Scientific Conference, State Agrarian University of Moldova, Volume 31, Chisinau 2012

RISK PERCEPTION AND RISK MANAGEMENT STRATEGIES BY FARMERS IN AGRICULTURE SECTOR OF PAKISTAN

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Abstract

The present study focuses on the risk perception and risk management strategy used by Pakistani farmers in agriculture sector. Agriculture activities are the basic source of revenue and play an important role in the growth of its GDP. The sector helps to provide the gainful employment to a large percentage of population especially in Pakistan. Farmers are always operating under risky conditions. They have to face many risks and uncertainties arising from natural, economical and social environments. The more the farmers would learn about risk possibilities and risk management tools available to them, the better they will be in a situation to cope with it. The basic purpose of research is to provide the pragmatic insights that how farmers in Pakistan perceive and manage the risk. Farmers in the districts of south Punjab will be targeted through conducting detailed interviews and using questionnaires by asking questions about specific issues. Moreover, literature will be reviewed for its application in risk perception and management by farmers. Research findings can be helpful in developing an integrated risk management strategy framework, which will prove beneficial for agriculture sector in Pakistan.

Key words: agriculture, risk perception, risk management

INTRODUCTION

Agriculture and other related activities are the major source of revenue and living for developing countries, especially in rural areas. It plays an important role for improvement in GDP. But the biggest issue is that agricultural production is exposed to a variety of risks and can vary based on certain situations and other related conditions. The basic reason of huge risk factors is because of high dependence on natural environment like temperature deviation, crop disease, rainfall, pollution etc. and most important instability in prices due to changes in market conditions (Singla & Sagar, 2012). Sources of risk in agriculture can be classified as “business risk” (crop uncertainty, marketing problems etc) and “financial risk” (loans, funds etc) (Hardaker JB, 2004). Individual’s perception of risk can highly influence their investment and business decisions. In this regard, farmers tend to use different risk management or risk avoiding strategies to minimize the influence rate. It is important to fully understand farmer’s risk predictions and that how it can affect their

behavior in order to develop and maintain sustainable business and to use effective programs and policies which can be implement at desired level. (Krogmann, 2001).

Few things in nature are certain (Williams, 1999). There are occurring constantly changes in weather and competitive forces, that’s why it keeps future always uncertain and unpredictable. Further, he claimed that risk is a very extensive subject because everything we do has an element of risk.

Ellis, in 1998, identified four types of risks: natural risks (weather, pests and diseases), market fluctuations (input and output prices), social uncertainty and state actions. Most analysts state the difference between risk and uncertainty on the assumption that these are biased issues based on the decision maker’s personal point of view about certain happenings. Production for a specific yield highly depends on “biophysical factors” (rain, type of soil and its quality, diseases and pests), input prices, availability of resource and specific consumption requirements (Korir, 2011).

It is necessary to clearly perceive the associated risk and utilize a useful strategy to cope with it in time (Hess, 2002). As, he states that due to poor risk management, it can direct towards a decline in farmers' earnings and as a result can lead to sale of their resources, use of savings or a decrease in living standard. with no use of formal techniques to manage risks, farmers might be invest less, might not implement advance farming tools and resort to take low risk, low capitulate strategies which affects overall production and prices (Sarhakh, Cole, & Tobacman, 2010).

Farmers and other participants in agriculture business can handle the several sources of risk before or after the happening of an unfavorable incident with the help of using "ex ante" and "ex post" strategies (Singla & Sagar, 2012). Farm size, age, innovativeness and risk aversion determine the alternative option of risk management strategy by farmers (Pennings, 2008). The identification of the sources of risk is important because it helps to choose the appropriate management strategy. Different farming systems and methods, the ratio of agricultural income to total family income, as well as the size of land, differentiates their risk response.

Farm enterprise diversification is used to cope against yield and price risk, disease and pest attacks and as well as weather variations. Farmers also adjust the level of inputs and output in order to manage risk (Ellis, Household Strategies and Rural Livelihood Diversification., 1998)

Natural hazards can be managed by irrigation, crop insurance and by growing resistant varieties. Market risk can be managed by price stabilization programs, provision of in-time information and credit subsidies.

MATERIALS AND METHODS

Self-administered questionnaire was used to collect primary data. As mostly farmers in Pakistan are illiterate that's why questionnaire was translated to them in Urdu to get appropriate response. The survey covered questions regarding different types of farming

activities like rice, wheat, potato, sugar cane etc. Appointments were made with farmers and interviews were conducted door-to-door especially in rural areas to be get sure about certain queries. The questionnaire included questions regarding following issues: risk attitude and sources of risks; possible risk perception strategies used by farmers; their basic goals and objectives to highly utilize their business. Some questions were asked to measure demographic characteristics of farmers like education, land size, yearly income, family size etc. 5-point likert scale (ranging from 5=strongly agree; 1=strongly disagree) was used to measure the response. Sample size was 200.

RESULTS AND DISCUSSIONS

In order to identify major sources of risk and strategies used by farmers, descriptive analysis was used to measure the results. Questions were asked about production, marketing, human, financial, political and social risks (Ahsan, 2010).

It was analyzed that production risk is considered as most important by farmers. It consists on weather variations and crop diseases. Almost, 62% respondents reported it as a major risk. Regarding market-related risk, fluctuations in demand and prices of crops were highly ranked. Survey results show that variations in input prices play an important role in creating risk. Institutional risk related to changes in economic and political conditions were ranked at third level.

Farmers were asked to rate different types of risk management strategies according to their products. Produce at lowest possible cost was considered the most important risk management strategy.

Liquidity and solvency were also found as important risk management strategies. Bardhan, in 2006, fFound the same observation regarding Indian dairy farmers.

Developing and maintaining good relations with government and implement advance business technologies were also considered useful risk management tools.

CONCLUSIONS

The results show that larger farm size and thus higher yearly productions increase the scope of contribution per hectare of farm and thereby increase the rentability of the farms.

The significant finding of this study is that farmers have a clear perception of various factors of risk related to their business, and they also keep on trying to have a clear strategy for how to handle those risks.

Results of this study could also provide some practical guidelines to policymakers for formulating and implementing effective policies and management strategies.

REFERENCES

- [1] Ashan, D.E., 2010, Farmers' perceived risks and risk management strategies in an emerging mussel aquaculture industry in Denmark, pp.309-323
- [2] Bardhan, D.Y., 2006, An Assessment of Risk Attitude of Dairy Farmers in Uttaranchal (India).
- [3] Ellis, F., 1998, Household Strategies and Rural Livelihood Diversification. *Journal of Development Studies*, 35(1), 1-38
- [4] Hardaker, J.B. H. R., 2004, Coping with risk in agriculture
- [5] Hess, U. S., 2002, Weather risk management for agriculture and agribusiness in developing countries
- [6] Korir, R. L. K., 2011, Risk management among agricultural households and the role of off-farm investments in Uasin Gishu County, Kenya
- [7] Krogmann, U. V., 2001, Land Application of Sewage Sludge: Perceptions of New Jersey Vegetable Farmers. *Waste Management Research* 19, 115-25
- [8] Pennings, J. I.M., 2008, Producers' Complex Risk Management Choices. *Agribusiness*, 24 (1), 31-54
- [9] Sarthak, G., Cole, S., Tobacman, J., 2010, Marketing complex financial products in emerging markets: evidence from rainfall insurance in India. www.basis.wisc.edu/live/amabrief10-09.pdf
- [10] Singla, S., Sagar, M., 2012, Integrated risk management in agriculture: an inductive research. *The Journal of Risk Finance*, Vol. 13(3): 199-214
- [11] Williams, J., 1999, Agricultural price risk management: The principles of commodity trading.

STRATEGY FOR THE DANUBE REGION - PRESENT AND FUTURE IN ROMANIA

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Abstract

The paper presents the progress made since the European Union Strategy for the Danube Region was adopted. The Strategy identified concrete actions and examples of projects in 11 thematic Priority Areas as a result of close collaboration between the Commission and the Danube Region countries. The Strategy facilitates new methods of working together to make the most of existing structures and resources. This cooperative method involves a wide range of stakeholders at national and regional level in Danube countries to drive the day-to-day implementation forward.

Key words: commitment, cooperation, Danube Region, opportunity, strategy

INTRODUCTION

The Danube macro-region covers 14 countries - including 8 EU Member States and Croatia. Home to over 100 million residents - one-fifth of the EU population, the region's countries differ in terms of economic strength, but are strongly interlinked, with potential for further integration and growth, as well as shared approaches to common challenges. [2] European Union Strategy for the Danube Region is an internal strategy of the European Union which have connected all three riparian states respecting the principles applied and the EU Strategy for the Baltic Sea Region - no new institutions, no new funds without changes in legislation.[1]

MATERIALS AND METHODS

On 16.09.2010 was held in Brussels Plenary Session of the European Economic and Social Committee (EESC) when was adopted the "European Union Strategy for the Danube Region". Now, three years after the adoption of the EU Strategy for the Danube Region, Romania and other 13 countries have prepared The National Forum Matrix for implementation of the EU Strategy for the Danube Region.

EUSDR is a long chain of consultations and debates that raised over 800 contributions that highlighted the wishes of the 14 countries affiliated to the Strategy.

The Danube states expressed their commitment to create a Danube macro-region, which is based on 4 pillars and focuses on 11 priority axes.

By 2020, all citizens of this macro-region should enjoy better prospects of life, economic development and prosperity of the local area, special conditions created for a higher education, reduce unemployment and increase employment in the labor market, modern and sustainable agriculture taking into account that Romania has pooled around 5.07 million hectares of agricultural land, representing 34.5% of total agricultural land nationwide. Danube macro-region motto is: "The Danube River of Opportunity"

RESULTS AND DISCUSSIONS

Year 2013 brings in Romania the second Annual Forum of the EU Strategy for the Danube Region that will be held on 27-28 October 2013, with the main topics of discussion:[5]

-Ensure and support the economic, social and cultural development of countries and regions

in the Danube basin in environmental compliance;

-Reduction of the gap between poorer regions and attracting new funds for the Danube Region;

-Connectivity (sustainable transport networks, energy, tourism, culture);

-Environmental protection, water resources and risk management;

-Prosperity and social – economic development (education, research, rural development, competitiveness, domestic);

-Improving governance (institutional capacity and internal security);

-Structural Funds by training technical and financial resources to achieve timely implementation feasibility studies SUERD in Romania, accompanied by a guide instrument flexible and smart guy for beneficiary future projects.

Today a few projects of the EUSDR started to take shape:

-Historic and symbolic link between Bulgaria and Romania. The Vidin-Calafat Bridge was built between Bulgaria and Romania to provide a vital link on a key priority route of the Trans-European Transport Network. The bridge, is a good example of bilateral cooperation.

-Removing shipwrecks and boosting sustainability. The Danube Shipwreck Removal Project aims to remove shipwrecks from the Danube, Sava and Tisa in Serbia, Romania and Bulgaria - improving navigation and ecological conditions so as to develop the inland waterway to its full potential.

-Connecting Danube SMEs. The Danube Region Business Forum, coordinated by the Austrian Chamber of Commerce, provides an important networking platform for over 300 SMEs.

-Research and Innovation . The European Commission's Joint Research Centre provides scientific support to the Strategy. A first joint Declaration of Danube Region Ministers for Research was signed in Ulm on 9 July 2012. The Commission fully supports this.

-Preventing floods. The Danube Floodrisk project promotes cooperation methods with 19

institutions in 8 Danube countries, sharing databases and flood mapping.

-Fighting crime. A police chief meeting in January 2012 launched an initiative to intensify cooperation among police authorities in the Danube Region, improving measures against river-related crimes (including organised crime), and setting up a transnational law enforcement platform.

2014-2020 SUERD encourage cooperation in the European Union and all the 14 countries , encouraging the expertise and involvement of governments, academia society, institutions, the bilateral chambers of commerce, employers' organizations, NGOs, county councils, mayors, etc., and not least SMEs. Extensive work is needed, involving appropriate combinations of institutions, sectors and countries. [4]

CONCLUSIONS

The European Union Strategy for the Danube River has started to show the first concrete results of innovative approaches of bilateral, interregional, inter-institutional and transnational cooperation in the fields of education, labour market and inclusion. [3]

A long-term and sustainable cooperation framework needs to be enabled which promotes decentralised but also coordinated work. A demand for professional exchange to develop ideas and to collaborate in concrete projects is clearly visible.

REFERENCES

- [1]European's Commission Communication on the Danube Strategy, 2010
- [2] European Commission, EU Strategy for the Danube Region , two years flowing 2013, 3
- [3]European Commission, EUSDR Report June 2013, Priority Area 09 To Invest in People and Skills Education and Training, Labour Market, Marginalised Groups, 2013, 2
- [4]Forum dedicated to the World Water Day and World Meteorological Day, Bucharest, 2013
- [5]Forum "Clean energy, green energy. Cernavodă, Danubian nuclear city", Cernavodă, 2013

MACROLEPIDOPTERA SPECIES WITH VULNERABLE STATUS AND THEIR IMPACT ON THE PROTECTED AREA OF DUMBRAVA SIBIULUI

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Abstract

The present work is a part of a complet study concerning of Macrolepidoptera from the forest “Dumbrava Sibiului” in the Sibiu county. They are presented only the species found by myself for the frist time from this area. I mention that these species were not found by me in the five collections of Lepidoptetra studied by me and preserved at the Natural Hystory Museum in Sibiu.

Key words: collections, “Dumbrava Sibiului” Natural Rezervation, Macrolepidoptera, species vulnerable

INTRODUCTION

Data on Macrolepidoptera species collected from “Dumbrava Sibiului” are reported over 120 years since the nineteenth century onwards. These are summarized in the following collections: Dr. Daniel Czekelius, Dr. Eugen Worell, Viktor Weindel, Heinrich von Hannenheim and Rolf Weyrauch. Existing material in collections aimed at the study mentioned, contributed to valuable scientific information to achieve this study [1,10,15,17].

During 2001-2011, the research work allowed to identify 243 species of Macrolepidoptera belonging to 162 genera and 18 families, out of entomological material consisting of 2.271 samples.

This material comes in a proportion of 54% and 46 % private collections of data in the museum collections mentioned above. Species nomenclature was updated after classification presented by László Rakosy, Marin Goia, Zoltan Kovacs in catalog published by the Society Lepidoptera Lepidopterological Romanian Romania in Cluj in 2003 [7,8,9,16].

MATERIALS AND METHODS

Macrolepidoptera for research and knowledge of Forest “Dumbrava Sibiului”, I used the

method of observation, photography and collecting adults to determine the species.

For collecting, transporting and displaying adult material and tools are needed to avoid any damage to the specimens collected in field laboratory where they are to be prepared and preserved stone.

Materials and tools used for the collection and display of butterflies:

- Wire entomological (net)
- jar with cork
- dropper bottle for ether or chloroform
- Envelopes for butterflies
- Tweezers flat-blade screwdriver (very good are the philatelic)
- Ace entomological
- Boxes of land
- Tension for butterflies
- Boxes insectary for collection
- Scrapbook for notes
- Labels
- Black Pencil
- Pocket Magnifier
- Kit for collection

For nocturnal Lepidoptera collection, are necessary :

- A strong light source,
- A very white screen,
- A screen stand,
- More wide-mouth jars with cork
- A rigid plastic.

RESULTS AND DISCUSSIONS

Of the 2,271 specimens belonging to 243 species, 1,698 were collected by the author which is 74.76 % of the species reported in forest "Dumbrava Sibiului". Other collections studied 573 specimens, representing 25.24 %, is divided as follows: 357 specimens belonging to 12 families, 110 genera, 142 species data from Weindel Viktor 's collection of 143 specimens belonging to 11 families, 35 genera and 51 species from the collection of Eugene Worell, 43 specimens belonging to 5 families, 28 genera and 35 species from the collection of Daniel Czekelius, 15 specimens belonging to 2 families, 6 genera and 7 species from the collection of Heinrich von Hann Hanneheim and 15 specimens belonging to 2 families, 2 genera and 2 species collection of Rolf's Weyrauch.

The oldest existing collections of data collection studied belong to Daniel Czekelius of the late nineteenth like *Pericalia matronula* L. existing species in a single sample collected at 29.VI.1888, species was not recovered until currently used by any other collector .

General faunal analysis (diversity, abundance, dominance) we made a show considerable diversity and abundance Macro studied area. According to these analyzes and observations of six families are dominant in diversity and abundance: *Hesperiidae* (10 species, 75 specimens) *Pieridae* (22 species -92), *Nymphalidae* (22 species, 213), *Satyridae* (14 275 species), *Lycenidae* (12 67 species), *Plebejinae* (14 species, 82).

Of the 243 species described November 71 species reported to the studies by the 55 genera and 14 families respectively, which is 29.3 % of the species described in the area. As a result, the choice of the habitat by the new species was due to environmental conditions have changed over time. Others have been introduced with different crops in the surrounding areas of the forest, so finding a favorable habitat by host plants, which is the place of submission of tips for females and larvae feed support. All of the species, 114 species have been found 46.9 % and 58 fauna species of interest, 23.8 % were collected

species present but in the past they can be found also in the 5 entomological collections studied.

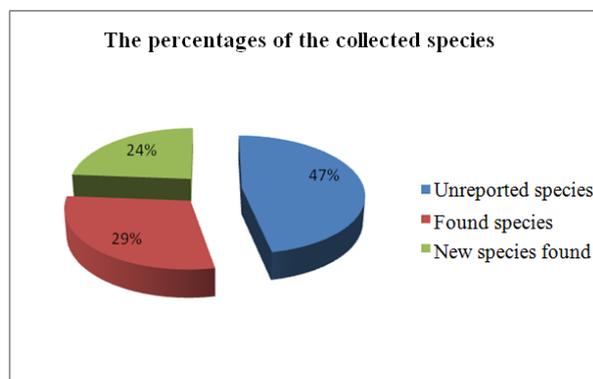


Fig.1.The percentage of the collected species

The dominant and characteristic species in the euconstante area are: *Brassicae*, *Pieris brassicae* L. - Family *Pierinae* -68 samples
- *Pieris rapa rapa* L., family - *Pierinae* -92 samples

- *Melita cinxia cinxia* L.-Family *Nymphalidae* -148 samples

- *Melanargia galathea* - Family *Satyridae* - 134 samples

Also in the study area are a number of rare species as: *Pyrgus alveolus* Hub., *Hesperia coma coma* L., *Neptis rivularis rivularis* Scop., *Neptis sappo* Pallas, *Nymphalis xanthomelas* D.&S., *Pararge achine achine* Scop., *Minois dryas* Scop., *Strymonidia pruni* L., *Lycaena tityrus* Poda.

Of the 10 studied species are migratory as: *Agrius convolvuli* L., *Acherontia atropos* L., *Macroglossum stellatarum* L., *Agrotis segetum* L., *Pieris brassicae* L., *Pontia daplidice daplidice* L., *Colias crocea crocea* f. *helice* Geoff.&Foerc., *Vanessa atalanta* L., *Vanessa cardui* L., *Aglais urticae* L.

On the basis of family structure relative to genus and species is noted that the following families: *Lemonidaea*, *Notodontidae*, *Chenuchidae* are very poorly represented in Forest "Dumbrava Sibiului" habitat at a rate of 0.62 % to 0.41% genera and species of all known species in the study. The proportion of 1.23% in genera representing two genera belonging to each family are included the following Families: *Saturniidae*, *Papilionidae*, with a rate of 1.85% which is three genera belonging to each

family: *Lymantriidae*, 2.47 % genres *Drepanidae* Families, *Thyatiridae*, 3.70% genres *Pieridae* families, genera of the Family *Hesperiidae* 4.32% with 4.54% genera of the family *Sphingidae*, 5.55% genera *Lasiocampidae* Family [3,4,5,6].

Top genres represented are Family *Geometridae*, a total of 38 genera, followed by the *Noctuidae* family has 32 genera and 13 genera *Nymphalidae* Family. The species is the largest family *Geometridae* with 53 species, followed by family *Noctuidae* and *Nymphalidae* 40 species with 25 species. There are also a number of species heliofile with a large number of representatives of families: *Lycaenidae* 26 species, *Pieridae* 19 species, *Arctiidae* 14 species, *Lasiocampidae* 14 species and *Satyridae* 10 species [11,12,13,15].

After analyzing the overall biological and ecological (environmental groups, food regimen, stage of development, during the flight) we obtained the following results:

It was founded that the predominant species oligophag (58 %) poliphag (24%) are less numerous; monophag is rare (18%);

Also related to flight period of the species have been reported classifies species according to the number of generations per year in species monovoltine which are the most numerous and represent 63 % of all species, bivoltine with a percentage of 33 % and trivoltine by only 4%.

From field observations, we could study the mating behavior of the species *Lotus corniculatus*, *Trifolium arvense*, *Vicia sp.*, *Lathyrus aphaca*, *L. montanus*, *L. pratensis*, *L. tuberosus*, and other spp especially legumes. Preferred hours are morning flight on sunny days 10-12, and other aspects of the ethology and ecology of Macrolepidoptera species that are described in each species[14].

We prepared a summary of the flight periods of the species studied, the general dynamics shows that during the fly most species were found in the interval between the months of May to August, these data are new to the area. To facilitate national and international comparisons, we performed the analysis of the following categories and degrees of

endangerment recommended by IUCN in 2000 and 2001 [8,9]:

CR- 4 species critically endangered taxa 1.6%

EN- 5 species endangered taxa 2.2%

VU- vulnerable taxa 28 species 11.5%

NT- potential- threatened taxa 62 species 25.5%

DD- 3 species 1.2%

species that do not fall into these categories 141 species 58 %

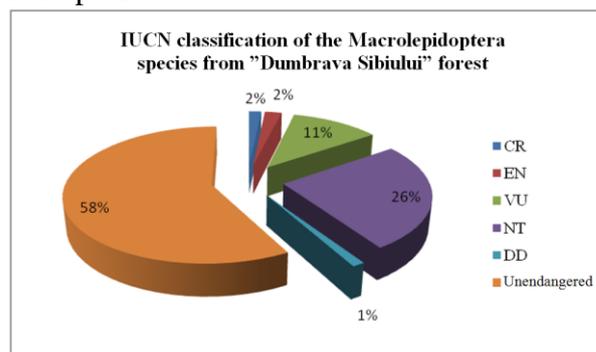


Fig.2. Classification of Macrolepidoptera species from "Dumbrava Sibiului" forest

CONCLUSIONS

It can therefore be said that the macroentomofauna in Forest Dumbrava Sibiului is diverse, well structured with 71 species and 129 species dominant constant. There is a specialization habitats and microhabitats, the species of host plants caused by ecological valence species. There are a variety of ecological niches, the full exploitation of trophic base.

Specifics of the forest, its important function mediogenă and biodiversity conservation, its declaration in 1994 led natural park. This decision contributed research results in forest grove Sibiu on various groups of insects [2].

As recommendations regarding protection lepidopterofaunei in Forest Dumbrava Sibiului suggest the following:

Taking special measures for the protection of wild flora that serves as the basis trophic larvae, and in the case of rare plant species or already extinct in the area to be cultivated in introducing the then directed spontaneous flora for its recovery.

Using classic electric lighting perimeter

Forest Dumbrava Sibiului where there are many tourist attractions and leisure, avoiding fluorescent lighting that attract some species of Lepidoptera *Noctuidae* especially of what are death and knowing that they have an affinity for lights.

Ban on night traffic on roads surrounding forest or use of motor vehicles to avoid collision with dipped *Noctuidae* species that are attracted to light sources.

Prohibition of use of chemical plant control Forest Dumbrava Sibiului and surrounding areas that are now forest plots.

Captive breeding of species which are now extinct elsewhere in the country raised for restocking the study area.

Priorities for further research on topics relating to the thorough study lepidopterofaunei which includes both species and Micro-Macrolepidoptera Forest "Dumbrava Sibiului", this is a step forward postdoctoral work in this research.

Research results have been materialized through the publication of the first monograph entitled *Macrolepidoptera of Dumbrava Dibiului Forest area* publishing in Press house University "Lucian Blaga" Sibiu.

ACKNOWLEDGMENTS

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REFERENCES

[1] Bucșa C., Tăușan I., 2011. Istoricul cercetarilor entomologice din împrejurimile Sibiului, Vol. *Lucrari al Simpozionului Biodiversitatea și Managementul insectelor din România*, p:179-200

[2] Bucsa, C., 2011, Municipiul Sibiu și zona periurbană. *Repere ecologice*, Editura Univ. " Lucian Blaga", Sibiu (in press), 220 p.

[3] Niculescu, E. V., 1961. Lepidoptera- Fam. Papilionidae (Fluturi). *Fauna RPR Insecta*. XI (5), Editura Academiei RPR București.

[4] Niculescu, E. V., 1963. Lepidoptera- Fam. Pieridae (Fluturi). *Fauna RPR Insecta XI (6)*. Editura Academiei RPR București.

[5] Niculescu, E. V., 1965. Lepidoptera- Fam. Nymphalidae (Fluturi). *Fauna RPR Insecta XI (7)*. Editura Academiei RPR București.

[6] Niculescu, E. V., König F., 1970. Lepidoptera (partea generală). *Fauna RSR Insecta XI (10)*. Editura Academiei RSR București.

[7] Rákósy, L., Goia, M., Kovacs, L., 2003a. *Catalogul lepidopterelor României*. Societatea Lepidopterologică Română Cluj-Napoca.

[8] Rákósy, L., 2003b. Lista roșie pentru fluturii diurni din România (Rote Liste der Tagfalter Rumäniens) *Bul. inf. Soc. lepid. rom.* 13(1-4):7-18.

[9] Rákósy, L., 2005. U.E. și legislația pentru protecția lepidopterelor din România. *Bul. inf. Entomologic Cluj- Napoca*. 16(3-4):89-96.

[10] Schneider-Binder Erika, 1973. *Pădurile din Depresiunea Sibiului și dealurile marginale*. *Studii și Comunicări Științele Naturii Muzeul Brukenthal Sibiu (18)*: 71-100.

[11] Stancă-Moise C., 2011, Impact of climate factors and anthropogenic on Macrolepidoptera activity of the forest Dmbrava Sibiului, Romania. *Proceedings of the 7th International Conference, Integrated Systems for Agri-Food Production. SIPA*

[12] Stancă-Moise C., 2007. Biodiversitatea faunei de Macrolepidoptere (Insecta, Lepidoptera), din ecosistemul Pădurii "Dumbrava Sibiului" în perioada anilor 2001-2006, *Lucrările celei de a 8 Conferință Națională pentru Protecția Mediului prin Biotehnologii și a 5-a Conferință Națională de Ecosanogeneză*, 26-27 mai Brașov. p:64-66.

[13] Stancă-Moise C., 2007. The specific index in view of ecological diversity analysis of the lepidopterofauna populations in the natural Reservation „Dumbrava Sibiului”. *Proceeding of the International Conference „Agricultural and Food Sciences, Process and Technologies” with theme „Agriculture and food Industry within the Context of European Integration”, april 26-28 Timișoara*. p:439-442.

[14] Stancă-Moise C., 2004. *Importanța Macrolepidopterelor în cadrul ecosistemului pădurii de stejar „Dumbrava Sibiului”*. Oltenia. *Studii și Comunicări Științele Naturii*, vol. XX: 219-222.

[15] Stancă-Moise C., 2002. The entomologists from Sibiu their contribution to the knowledge of the Lepidopterofauna of Sibiu-Surroundings collections, *Lepidoptera Macrolepidoptera*. *Analele Științifice ale Universității „Al.I.Cuza” Iași*, s. Biologie Animală, Tom XLVIII:7-11.

[16] Székely, L., 2008. *The Butterflies of Romania-Fluturii de zi din România*. Brastar Print-Brașov. 305 pp.

[17] Worell, E., 1951. Contribuții la cunoașterea faunei de coleoptere și lepidoptere, mai ales din împrejurimile Sibiului – *Bul. Șt. Secș. Șt. Biol. Agron., Geogr., Geol.* (3):533-543.

STUDIES ON THE MANAGEMENT ISSUES IN THE GUESTHOUSES

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Key words: *guesthouses, management, The Advocacy Group for Guesthouses, Romanian Association of Eco-Tourism, tourism adjacent fields.*

Abstract

The laws governing the activity of guesthouses did not pass. Within a study carried out by the Romanian Association of Eco-tourism analyzing the problems of owners and managers of guesthouses and their opinion regarding the laws in the field, owners of guesthouses have only awarded a 4.80 score to the laws ruling the activity in this field. The results of the study have been officially released during Bucharest Tourism Fair within a seminar taking place on March 15th, 2013. The study showed that tourism direct legislation does not represent a problem for guesthouses, but adjacent fields such as sanitary, veterinary, fire fighting or labour procedures stand as a brake for the development of the guesthouses sector.

INTRODUCTION

In order to **support** some approaches in this field, it was established the Advocacy Group for Guesthouses (GAP), realized by the Romanian Association of Eco-Tourism, the National Association for Rural, Ecological and Cultural Tourism (ANTREC) and the Association of the Most Beautiful Villages in Romania (ACFSR). ***GAP's target is the real support of the guesthouses sector*** by means of an integrated approach of the legal field where all sectors adjacent to the tourism activity would meet up in an unitary frame, ***which needs to be analyzed once more and simplified at least as far as small guesthouses are concerned in order to support and encourage this economic sector*** which is so useful for the rural area. [Beciu, S., 2011]. The hereby research wishes to give warning with regard to the real problems that small guesthouses in the rural area deal with.

MATERIALS AND METHODS

The hereby study has been carried out within the **Advocacy Project** for environmental protection and tourism sustainable development implemented by the Romanian Association of Eco-Tourism (AER) in

partnership with the Retezat Association of Tourism and the Tara Dornelor Association of Eco-Tourism, financed by the Foundation for Partnership and the CEE Corporation.

This study has been carried out by the Romanian Association of Eco-Tourism (AER) from August to December 2012 in order to identify the problems that owners and managers of guesthouses deal with from a legal point of view. [Crețu Romeo Cătălin, 2012].

Analyzed guesthouses are part of all classification categories. The questionnaire that stood as basis to the study is made up of **40 questions** concerning the entire construction, authorization, functioning and control process of guesthouses. [Tindeche Cristiana, 2013]

RESULTS AND DISCUSSIONS

The research reveals some problems and some deficiencies of the legal frame that should stand as basis of a national study on a representative number of respondents for the following purposes:

- To have a clear and well fundamented image of the legal problems in this field;
- To gather statistical information concerning the real dimension of the economic impact of guesthouses in the rural area (including those

in the grey and dark zone of the economy). The characteristics of the business types that filled in the questionnaire are the following:

- Lodging capacity from 4 to 43 places;
- Classification between 1 to 4 flowers
- Affiliations: The Romanian Association of Eco-Tourism, Retezat Association of Tourism, Tara Dornelor Association of Tourism, Nature Friends International, ANTREC;
- Year of establishment: 1995 – 2012;
- Localization: Suceava, Hunedoara, Braşov, Maramureş, Tulcea, Covasna;
- 53% of the guesthouses have registered an average staying duration of 3 to 5 nights;
- 86% of the guesthouses do not receive any or under 30% of tourists through travelling agencies;

Along with this quick evaluation by means of the questionnaire, in order to get a global image of the problems in this field, as well as for purposes of identifying the solutions at European level, the following activities have been carried out:

1. Analysis of the Romanian legislation existing in the field done by a jurist;
2. Study of the situation existing in the rural tourism/eco-tourism in the following countries (with tradition in rural tourism): Spain, Ireland, Sweden, Austria.

These activities are part of the project called “*Advocacy for environmental protection and sustainable development through tourism*”, implemented by AER in partnership with the Tara Dornelor Association of Eco-Tourism (AETD) and the Retezat Association of Tourism (ATR) and financed by the Foundation for Partnership and the Trust for Civil Society in Central and Eastern Europe from April 1st, 2013 to March, 31st 2013.

Results of the research

Before presenting the centralized results of the research, we would like to underline the fact that these show strictly the respondents’ opinion, therefore they comprise a note of partialism based on their own experience in interacting with the institutions which are responsible for the activity of guesthouses. Sometimes, the answers to some open questions stand as a proof of not knowing the laws in force or even the mislead of the respondent.

[HonţuşAdelaida, 2005]

Section A:

The vast majority of the answers to this question refer to the amenities for serving meals, owners being dissatisfied by the fact that a 4 bedrooms guesthouse must have the same amenities as a restaurant. This way, it becomes clear that a small guesthouse cannot afford from a financial point of view to meet these requirements, being forced therefore to offer food services without authorization.

Section B: Food supplying services

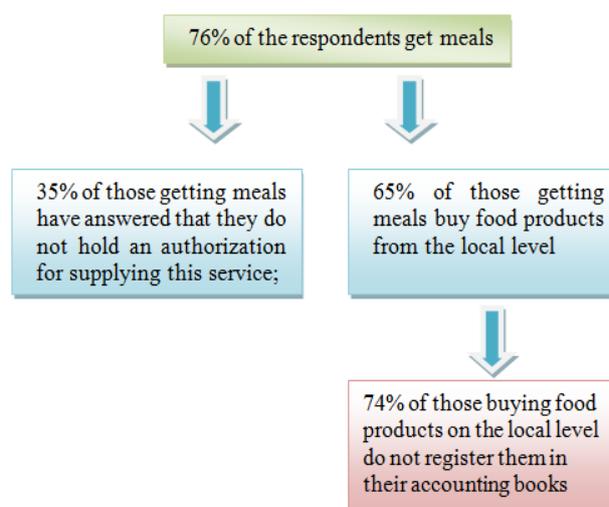


Fig. 1. Food supplying services

Out of those answering that they serve meals, 35% have answered that they do not hold authorization for this kind of service. Thus, 50% of all respondents do not serve meals at all or they do it without authorization especially due to the fact that legal stipulations are not adapted to the reduced size of this type of business. In most cases, this situation is to be seen at small and very small guesthouses (fewer than 5 rooms) that cannot afford from a financial point of view to equip proper kitchens at a restaurant's level.

Section C: Authorization

The below diagram shows a few very interesting aspects. Therefore, as an answer to the question how difficult it has been to get the authorizations needed for opening a guesthouse, most of the reported problems had to do with the prevention and fire fighting procedures, as well as with the environmental and sanitary-veterinary requirements. For

classification purposes, it is important that over 90% of the respondents have declared that it has been very easy or easy for them to get the classification certificate.

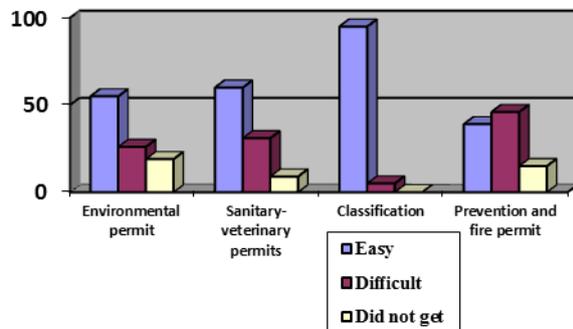


Fig.2. Diagram difficulty obtaining the authorization (%)

Therefore, the conclusion is that the tourism legislation does not really represent an impediment for the owners of guesthouses, but rather the laws existing in other fields that have an impact over this economic sector. It is equally important the fact that almost 20% did not get any of the above mentioned authorisations.

Table 1. Problems encountered during the authorization

Environmental permit: Too long time Bureaucracy Lack of information	Classification certificate: Too long time Bureaucracy
Sanitary-Veterinary permit: Bureaucracy Too long time Lack of information Bribe	Prevention and fire fighting permit: Too long time Costs Bureaucracy Lack of information

As far as the problems encountered during the authorization and re-authorization process are concerned, most have reported problems that have to do with too long time and bureaucracy. An interesting point of view is the one that has to do with the high costs for obtaining the prevention and fire fighting authorization, while very few problems have been reported in relation to obtaining the classification certificate from the Ministry of Tourism.

Section D: Check-ups

This section provides a perspective over the activity of guesthouses. Practically, there are no less than 7 (seven) inspection institutions, each of these being able to do an unlimited

number of check-ups every year. It all leads to the conclusion that the owners and the managers of this type of accommodation structures are busy more with check-up inspectors than with tourists. The below diagram shows us the frequency of check-ups for each institution over the past two years. The conclusion is that fire brigade runs check-ups on a regular basis, once a year in most cases. Most institutions have carried out even more than 5 (five) check-ups to the same entity in only two years.

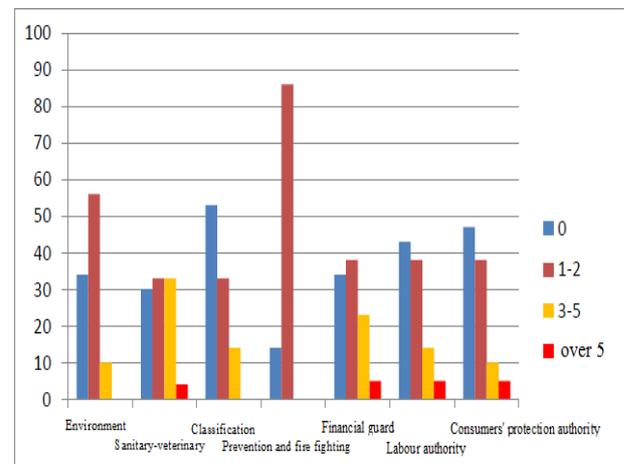


Fig.3. Frequency of check-ups

When being questioned with regard to the number of fines that they got during the past two years, the conclusion is that over 50% have got at least one fine, while 5% of the respondents have declared that they even got more than 5 fines. Despite all this, the majority have declared that inspectors have shown flexibility in awarding penalties.

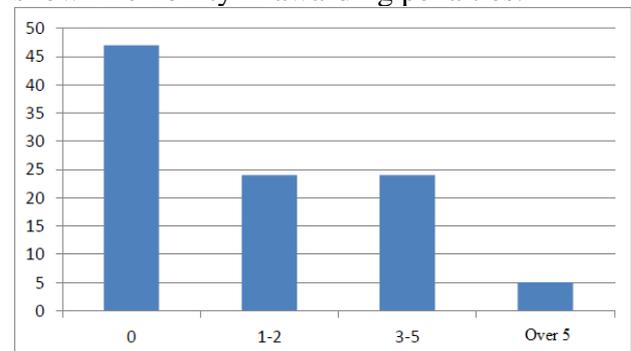


Fig.4. Number of fines

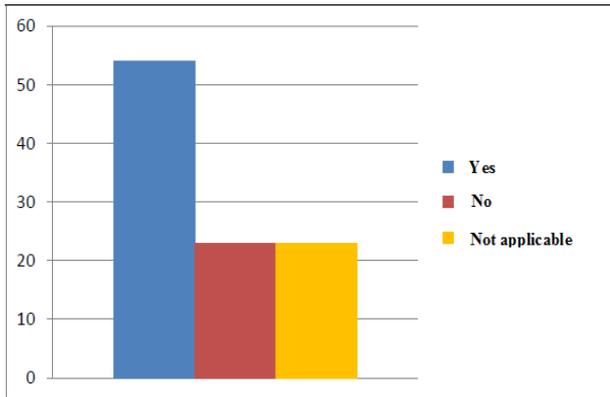


Fig.5. Flexibility in awarding penalties

Section E: Tourism fee

As far as this research is concerned, it was a great interest in finding out if the destination of the tourism fee established by decision of the Local Council is known.

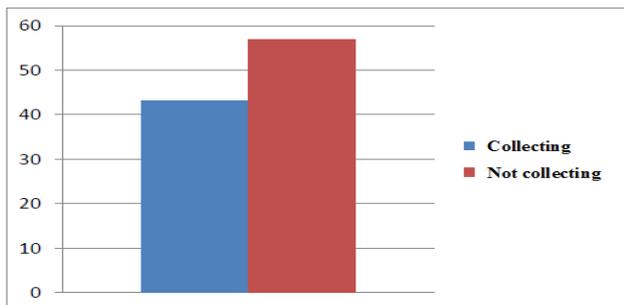


Fig.6. The percentage of the localities collecting fee

CONCLUSIONS

Evaluation of the legislation in force.

One of the conclusions is that the fee is collected in 43% of the cases, but none of the respondents could not indicate how the collected amounts are spent. We would like to underline the fact that the respondents are

located mainly in the rural area, some of them poorly developed from a touristic point of view [Crețu, R.F., Șerban, E.C. 2011]. This explains the low percentage of the localities collecting this fee, but does not account for the lack of transparency on the authorities' side. Thus, from the point of view of the owners and managers of guesthouses, the laws in force in the field do not even succeed in scoring a passing level.

REFERENCES

- [1] Antoană Niculaie, Foriș Tiberiu, Crețu Romeo ș.a., 2002, *Managementul turismului. Eco-turism componentă de modernă turism*, Psihimedia Press Ltd, Sibiu.
- [2] Beciu, S., Popa, O.E., Nistor, Ș., Olteanu V., 2011, *The Socio-Economic Dimension Of Rural Development For The North -East Region Of Romania*. African Journal of Agricultural Research, ISSN 1991-637X
- [3] Crețu, R.F., Șerban, E.C. (2011). Analysis of the facts that have generated crisis and their impact on the SMEs in Romania. Universitatea "Lucian Blaga" din Sibiu, Facultatea de Științe Economice, 18th International Economic Conference IECS 2011 „Crises after the crisis. Inquiries from a national, European and global perspective” Sibiu, România, May 19-20, 2011, ISBN 978-606-12-0139-6, pg. 160-166
- [4] Crețu Romeo Cătălin, 2012, *Legislația incatering and tourism*, CERES Press Ltd, Bucharest.
- [5] Honțuș Adelaida, *Amenajarea agroturistică a teritoriului*, Editura CERES, 2005
- [6] Tindeche Cristiana, 2013, *Analiza tehnico-economica a unitatilor de alimentatie publica si agroturism*, Editura CERES.
- [7] The Foundation for Partnership*, www.rep.ro
- [8] The Romanian Association of Eco-Tourism, www.eco-romania.ro/ro.

EGYPTIAN MUTUAL FUNDS ANALYSIS: HISTORY, PERFORMANCE, OBJECTIVES, RISK AND RETURN

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Abstract

The present research aims to overview the mutual fund in Egypt. The establishment of the first mutual funds was achieved in 1994. Nowadays, the total mutual funds reached 90 funds, approximately. The income funds represent the largest share of the Egyptian mutual funds (40%), growth funds (25%) and the private equity funds is at least (1%). The total population of the Egyptian mutual funds reached 22. Finally, the study proved that the Egyptian mutual funds have an impact on fund return, total risk and systemic; when analysis relationship between risk and return. The study found influencing for mutual fund's objectives on Sharpe and Terynor ratios.

Key words: mutual funds, mutual funds classification, performance of mutual funds, Egypt, Egyptian mutual funds

INTRODUCTION

Most of the researches in finance examine fund performance issues, broadly addressing the question: Do mutual funds “beat the market”? More recently, there has been a growing stream of research on institutional and structural aspects of mutual fund services and providers (Sirri and Tufano, 1998).

However, in this study, the researcher analyzed return and risk of mutual funds.

The main objective of the research is to analyze the relationship between risk and return of Egyptian mutual funds, and analyze the impact of mutual funds and their objectives on this relationship.

Mutual fund: An investment company that pools money from shareholders and invests in a variety of securities, including stocks, bonds, and money market securities. A mutual fund ordinarily stands ready to buy back (redeem) its shares at their current net asset value, which depends on the market value of the fund's portfolio of securities at the time. Mutual funds generally continuously offer new shares to investors (Reilly and Brown 2003).

Mutual funds history

Historians are uncertain of the origins of investment funds; some cite the closed-end investment companies launched in the Netherlands in 1822 by King William 1st of the Netherlands. He was credited with starting such a fund in 1822 and yet some even say that the King got the idea from a Dutch merchant named Adriaan van Ketwich whose investment trust was created in 1774. Similar pooled fund investment vehicles were started in Switzerland in mid-1849, followed by Scotland in the 1880s.(Citation needed)?

The first modern mutual fund came up in the US in 1924 and there were more than 700 funds that existed in the US just before the Great Depression (Kale and Panchapagesan 2012). Nowadays, many mutual funds are established in the United States, Europe and many emerging markets in Asia, Africa and South America.(Citation needed)?

In Egypt, the establishment of the first mutual fund was achieved in the last decade of the past century.

Mutual fund classification

Mutual fund classification criteria are the factors used to categorize mutual fund. There

are many criteria that are commonly used to classify the various types of mutual portfolios by what is generally referred to as type or category. These include six types:

- a. Trading shares (Closed - end fund and open-end fund)
- b. Components (Stock funds , bond funds and money market funds)
- c. Style (objectives) (see that later)
- d. Capitalization (size)(large-cap, mid-cap and micro-cap).
- e. Sector or industry
- f. Geographic coverage (local, international and emerging market)

Objectives of mutual fund

A mutual fund has many objectives which include:

- a. Growth funds seek high rates of return from capital gains where they undertake significant risks in order to earn these gain
- b. Income funds seek both cash dividend income and, capital gains and, as a result, are less risky than growth funds.
- c. Income and growth funds want to earn primarily cash dividends and, to a lesser extent, capital gains
- d. Balanced funds claim to be in pursuit of income, growth and stability.

Risk of mutual fund

The sources of mutual fund risk are:

- a. Business risk; b. Financial risk; c. Liquidity risk; c. Exchange rate risk; d. Country risk.

However, a mutual fund has two types of risks:

a. Systemic risk: The variability of returns that is due to macroeconomic factors that affect all risky assets. Because it affects all risky assets, it cannot be eliminated by diversification (Reilly and Brown, 2003).

b. Unsystematic risk: Risk that is unique to an asset, derived from its particular characteristics. It can be eliminated in a diversified portfolio (Reilly and Brown, 2003).

Risk management of mutual fund

Diversification is one of two general techniques for reducing fund risk. The other is hedging.

Diversification relies on the lack of a tight positive relationship among the assets, returns, and works even when correlations are

near zero or somewhat positive. Hedging relies on negative correlation among assets, or shorting assets with positive correlation.

A hedge is an investment position intended to offset potential losses that may be incurred by a companion investment. A hedge can be constructed from many types of financial instruments, including forward contracts, swaps, options and insurance.

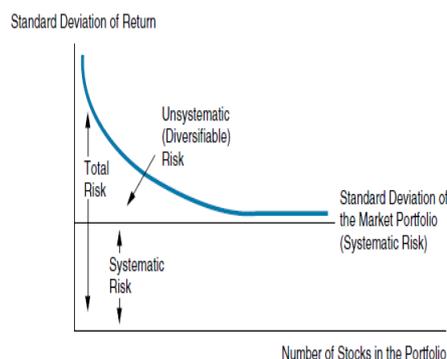


Fig.1. Risk of mutual fund.

Performance measures of mutual fund

Evaluating the performance of mutual funds in general, mainly related to the determination of the success of the portfolio manager to achieve balance between the different rates of return and acceptable levels of risk.

Thus, evaluating the performance of mutual funds does not mean only measure return on these funds, but also means measuring the levels of risk associated with those returns during a certain time.

There are many methodologies to measure the performance of mutual funds¹, Since 1965 Treynor, Sharpe were the first researchers whom evaluate fund performance (Treynor, 1965 and Sharpe, 1966).

Treynor ratio:

Treynor (1965) developed a method for measuring performance² and evaluating the fund by using Treynor's ratio. This ratio estimates return generated by the fund over and above risk free rate of return (generally taken to be the return on securities backed by the government, as there is no credit risk associated), during a given period and systematic risk associated with it (Beta). The equation form is shown as follows:

$$TR = (R_P - R_F) / \beta_P \dots \dots \dots 1$$

where: TR- Treynor ratio, R_P -Average fund return, R_F -Average risk free rate (3-month T-Bill) and β_P - Beta of the fund.

Sharpe ratio:

In this ratio, performance of a fund is evaluated on the basis of Sharpe ratio, which is a ratio of returns generated by the portfolio over and above risk free rate of return and the total risk associated with it. According to Sharpe(1966), it is the total risk of the portfolio that the investors are concerned about.

So, the model evaluates portfolios on the basis of reward per unit of total risk, as shown in equation 2:

$$SR = (R_P - R_F) / \sigma_P \dots\dots\dots 2$$

where: SR- Sharpe ratio, R_P - Average fund return, R_F -Average risk free rate (3-month T-Bill) and σ_P -Standard deviation of returns of the fund.

MATERIALS AND METHODS

The authors used the survey method to describe and analyze the relationship between risk and return of Egyptian mutual funds.

The authors collected data from the Egyptian Stock Exchange, The Egyptian Investment Management Association (EIMA) and Central Bank of Egypt.

RESULTS AND DISCUSSIONS

The Egyptian Funds

In 1994, the first Egyptian mutual funds were established in industry field and in 2012, 7 mutual funds were established. During the period of 1994 till 2013, the established mutual funds reached approximately 90 funds in Egypt (Fig.2).

¹ See also:

- Jensen's alpha.
- The Modigliani and Modigliani Measure (MM).
- The Information Ratio (IR).
- The TT measure (TT).
- Snail Trail Method.

² The Fama's Performance Measure.

Egyptian mutual funds had three currencies as a basis for issuing as follows:

- a. Egyptian Pound(L.E.)*
(57,782,453,128 L.E. at 31/12/2012)
- b.U.S. Dollar
(93,024,125 \$ at 31/12/2012)
- c.Euro
(24,475,953 € at 31/12/2012)

*One American dollar = 6.95 Egyptian pound (L.E.) according to prices of 2013

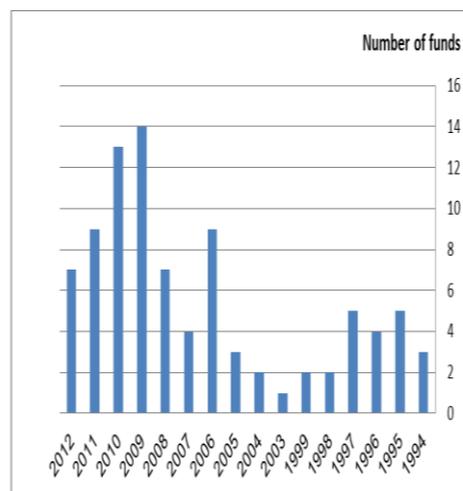


Fig. 2: Number of funds issued each year.

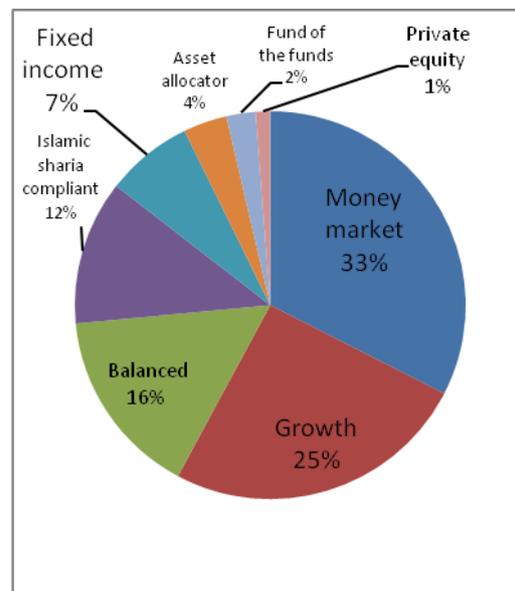


Fig.3: The structure of the Egyptian mutual funds.

The population

The population of the study is Egyptian mutual funds; this mutual funds classification

criteria objectives (Income funds - Growth funds - Income and growth funds -Balanced funds). The present study has 22 Egyptian mutual funds.

Statistical analysis

1.The relationship among mutual fund objectives and return

Table 1. Regression analysis among mutual fund objectives and return (Model and ANOVA).

A. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.548 ^a	.300	.265	1.1530

a. Predictors: (Constant), TY

B. ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	11.418	1	11.418	8.589	.008 ^a
	Residual	26.587	20	1.329		
	Total	38.004	21			

a. Predictors: (Constant), TY

b. Dependent Variable: R

Table 1 shows that the objective of Egyptian mutual funds explains (30%) of the fund return at the 5% level of significance.

2.The relationship among mutual fund objectives and total risk

Table 2. Regression analysis among mutual fund objectives and total risk(Model and ANOVA).

A. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.704 ^a	.495	.470	4.106E-02

a. Predictors: (Constant), TY

B. ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.306E-02	1	3.306E-02	19.610	.000 ^a
	Residual	3.372E-02	20	1.686E-03		
	Total	6.678E-02	21			

a. Predictors: (Constant), TY

b. Dependent Variable: TR

Table 2 shows that the objective of Egyptian mutual funds explains (49.5%) of the fund total risk at the 5% level of significance.

* One American dollar = 6.95 Egyptian pound (L.E.) according to prices of 2013.

3.The relationship among mutual fund objectives and systemic risk

Table 3 shows that the objective of mutual funds explains (45.8%) of the fund systemic risk at the 5% level of significance.

Table 3.Regression analysis among mutual fund objectives and systemic risk(Model and ANOVA).

A. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.677 ^a	.458	.431	.1865

a. Predictors: (Constant), TY

B. ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.589	1	.589	16.933	.001 ^a
	Residual	.696	20	3.478E-02		
	Total	1.284	21			

a. Predictors: (Constant), TY

b. Dependent Variable: SR

4.Sharpe's ratio and mutual fund objectives

Table 4.Kruskal-Wallis test for Sharpe's ratio.

Test Statistics^{a,b}

	S
Chi-Square	15.754
df	2
Asy mp. Sig.	.000

a. Kruskal Wallis Test

b. Grouping Variable: TY

From Table 4, it may be noticed that there are differences among Sharpe's ratio for Egyptian mutual fund objectives at the 5% level of significance.

5.Treynor's ratio and mutual fund objectives

Table 5:Kruskal-Wallis test for Terynor's ratio.

Test Statistics^{a,b}

	T
Chi-Square	15.754
df	2
Asy mp. Sig.	.000

a. Kruskal Wallis Test

b. Grouping Variable: TY

From Table 5, it may be noticed that there are differences among Terynor's ratio for Egyptian mutual fund objectives at the 5% level of significance.

CONCLUSIONS

In Egypt, the establishment of the first mutual funds was achieved in 1994. Nowadays, the total mutual funds reached 90 funds, approximately. The Income funds represent the largest share of the Egyptian mutual funds

(40%), growth funds (25%). and the private equity funds is at least (1%).

The objective of the Egyptian mutual funds has a great impact on funds return, total risk and systemic; when analyzing relationship between risk and return. The study was very influential for mutual fund objectives on Sharpe and Terynor ratios.

REFERENCES

- [1]Kale, J. R., Panchapagesan, V. , 2012, Indian mutual fund industry: Opportunities and challenges. IIMB Management Review, 24: 245-258.
- [2]Reilly, F., Brown, K., 2003, Investment analysis and portfolio management. 7th Edition, South-Western College Pub.
- [3]Sharpe, W. F., 1966, Mutual fund performance. Journal of Business, 39(1):119–138
- [4]Sirri, E., Tufano, P., 1998, Costly search and mutual fund flows. Journal of Finance, 53:1589–1622.
- [5]Treydor J. ,1965, How to rate management of investment funds. Harvard Business Review, 43:63–75.

ASPECTS OF OBSTACLES FOR APPLYING ACTIVITY BASED COSTING (ABC) SYSTEM IN EGYPTIAN FIRMS

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Abstract

The following investigation aims to determine the aspects of obstacles for applying Activity Based Costing (ABC) system in the Egyptian case and the significant differences among the effects of such obstacles. The Study used the survey method to describe and analyze the obstacles in some Egyptian firms. The population of the study is Egyptian manufacturing firms. This survey used the number of 392 questionnaires that were used throughout the total of 23 Egyptian manufacturing firms, during the first half of 2013. Finally, the study found some influencing obstacles for applying this system (ABC) and there were significant differences among the aspects of obstacles for applying ABC system in the Egyptian manufacturing firms.

Key words: ABC, activity based costing, cost account, Egyptian firms, manufacturing

INTRODUCTION

Cost Accounting plays an important and influential role in various aspects of the facilities of keeping pace with the requirements of society and the needs of the administration which change rapidly. Since the twentieth century, the world is facing a new era of overwhelming mutations in the field of nascent needs for managerial accounting. These nascent needs must be faced by applying a non traditional solutions in the area of managerial accounting for increasing the revenue of establishments.

Nowadays, in regard to the business environment, it can be observed that the cost accounting systems play an important role for determining many aspects of the work of firm which affect its competitive position. Therefore, it requires the application of an effective and efficient accounting system.

Many companies in various countries applied Activity Based Costing (ABC) system as a modern and progressive costing method because of its positive impact on the financial performance.

The main objectives of the research are to determine the aspects of obstacle for applying Activity Based Costing (ABC) system in Egyptian firms; and at the same time to determine the extent of similar effects between these obstacles.

Many studies concentrated on the presentation of the obstacles implemented by the Activity Based Costing (ABC) system and its importance when applied in the firms.

El-Gibaly and Diab (2012) mentioned that Egyptian companies are now operating in intensive competitive environment to make significant process improvements in areas such as quality, productivity and innovation, because that customer expects more product choices, at lower prices, with higher quality and faster delivery. It is also evident that companies nowadays need more accurate, timely and reliable operational and financial information to permit the managers to make effective strategic and tactical decisions about pricing, product line development, process improvements, product mix, investment decisions, etc.

Turney (2010) confirmed that the rise in the costs linked to implementation is the most important obstacles of implementation which prevented implementing the Activity Based Costing (ABC) systems in the economical units in addition to being among the systems which are described as complex systems. Helmy, in 2009, concluded that the recent and rapid changes in business environment led to the emergence of modern systems of cost and increasing global competition to maximize the role of cost management. The precise knowledge of the product cost and its pricing as well as proper planning concepts became more important than they were in the past. Each establishment is seeking for gaining a competitive advantage to enable them to survive and continue in the global market competitiveness.

Grasso (2005) stated that the criticisms to the Activity Based Costing (ABC) systems exceed the advantages expected from them where the costs related to implementing, developing and maintaining this system exceed the advantages which the system achieves such as improving profitability and increasing the competitive capacity for some American companies. He also pointed out that many of the companies which did not depend on implementing these systems, but they still rely on the Traditional Costing (TC) system.

Sievanen and Tornberg (2002) showed that the Activity Based Costing (ABC) systems are very complicated and very expensive. They also stated that the economical units are in dire need to provide a costing system which collects between the operational and strategic theory which is something not available in the Activity Based Costing (ABC) systems which have strategic view.

Merchant and Shields (1993) stated that some economical units do not need to implement Activity Based Costing (ABC) systems because these units need concentration on providing competitive features without giving attention to providing accuracy suitable for costing because these units enjoys some features such as relying on fixed technical product or producing products with relatively

short life cycle which reduces their wish in implementing such systems.

Nicholls(1992) illustrated that the management opposition to get rid of the Traditional Costing (TC) system and implementing the Activity Based Costing (ABC) system and its objection to changes or to provide the required financial resources, is one of the obstacles which obstructs implementing it

Therefore, it may be deduced that it is possible to overcome the opposition of the management and workers in the economical unit to the changes through transferring them from receiving the changes to partners in the changes; in addition to persuading them of the benefits occurring to them and to the economical unit from implementing the Activity Based Costing (ABC) system in the appropriate form and the necessity to train them sufficiently on implementing this system.

Piper and Walley (1991) mentioned that the selection of cost drivers is very difficult because the activities consist of a group of works which are practiced inside the organization; in addition to that each activity consists of secondary activities and then the workers select the cost drivers with a large number of cost drivers for works; and then select one of them only to become the cost drivers for the activity which is something not easy .

From the previous studies, it may be summarized what stated above, in that there are many obstacles to implement the systems successfully in the economical units; and that it is most important takes the form in the management and workers objection to the change and to the in-ability to provide the required financial resources and difficulty in implementing this system which are characterized of their being complicated and difficulty in determining the cost drivers relate to various activities.

MATERIALS AND METHODS

The authors used the survey method to describe and analyze the aspects of obstacles

for applying Activity Based Costing (ABC) System in Egyptian firms. The population of the study was some of the Egyptian manufacturing firms.

The model of study includes main independent variables which represent obstacles for applying Activity Based Costing (ABC) system in Egyptian firms

The following function was used:

$$Y = f(X_1, X_2, X_3, X_4, X_5, X_6)$$

where:

Y = Impact of obstacles for applying Activity Based Costing (ABC) system on financial performance of firm.

X₁:The weakness of support from top management.

X₂:The weakness of human expertise.

X₃:Resistance to change.

X₄:The weakness of system accounting .

X₅:The costs of design and application system.

X₆: The random behavior of indirect costs.

The authors can be depicted the proposal model as shown in Fig.1.

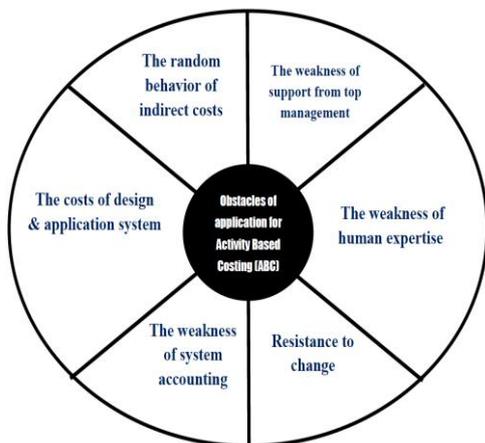


Fig.1: Obstacles of application for Activity Based Costing (ABC) system.

Data.The authors used the questionnaire instrument in addition to the test approach to confirm the correctness of views collected. The number of questionnaire instruments sent was 478 and the number of the received questionnaires was 392 with a response percentage of 82%.

Methods and data analysis

The study used a Statistical Package for the Social Sciences (SPSS) for application of

reliability, descriptive and inferential statistics.

RESULTS AND DISCUSSIONS

Statistical analysis

1.Reliability

The correlation coefficient between the dimensions (Obstacles) was significant (at level 1%) and the Cronbach-Alpha Coefficient was 80.64.

2.Descriptive

Table 1 shows values of mean and Standard Deviation (S.D.) of survey dimensions.

Table 1. Descriptive statistics values

No	Dimension	Mean	Standard deviation
1	The weakness of support from top management.	3.9005	1.2865
2	The weakness of human expertise.	3.1990	0.9786
3	Resistance to change.	3.7066	1.1766
4	The weakness of system accounting.	3.7041	1.2301
5	The costs of design and application system.	3.4515	1.0812
6	The random behavior of indirect costs.	2.1046	1.2900

Source: SPSS output

The descriptive statistics of dimensions impact showed that the mean values for the weakness of support from top management (3.9005) > resistance to change (3.7066) > the weakness of system accounting (3.7041) > the costs of design and application system (3.4515) > the weakness of human expertise (3.1990) > the random behavior of indirect costs [Technical dimension] (2.1046).

Also, the Standard Deviation (S.D.) values for the impact of dimensions mentioned above were 1.2865, 1.1766, 1.2301, 1.0812, 0.9786 and 1.2900, respectively.

3.Inferential statistics

Table 2. Output of Friedman Test (Ranks and test statistics)

a.Ranks

Rank	Mean rank
X1	4.24
X2	3.16
X3	3.85
X4	3.85
X5	3.53
X6	2.37

b. Test statistics

N	392
Chi Square	673.890
df	5
Asymp.Sig.	.000

Source: SPSS output

From Table 2, it may be observed that there are significant differences among the aspects of obstacles for applying Activity Based Costing (ABC) system in Egyptian firms.

CONCLUSIONS

The Activity Based Costing (ABC) system is one of the main alternatives to cost systems for manufacturing firms, however this system has not widely spread in Egypt. The questionnaire stated some important aspects of obstacles for applying ABC system. Statistical analysis showed that there were significant differences among these aspects of obstacles for applying ABC system in Egyptian manufacturing firms. These obstacles may be arranged, in descending order, according to their impact severity for applying Activity Based Costing (ABC) system on Egyptian firm performance as follows: a) The weakness of support from top management, b) Resistance to change, c) The weakness of system accounting, d) The costs of design and application system, e) The weakness of human expertise, f) The random behavior of indirect costs [Technical dimension].

REFERENCES

[1] El-Gibaly, M. M ., Diab, A.A.A, 2012, A model to integrate of the ABC and the BSC in the Egyptian companies: Aligning strategic efficiency and performance improvement (Field Study), Journal of American Science, 8(6):543-554.
 [2]Grasso, L. P., 2005, Are ABC and RCA accounting systems compatible with lean management?. Management Accounting Quarterly Montvale, 7(1):12-27.
 [3]Helmy, K. M. A. , 2009, The role of target cost to increase the competitive capacity for Egyptian establishments by applying on industrial sector. Unpublished M.Sc. Thesis, Fac. of Economic Science, University of Aurel Vlaicu, Arad, Romania:110-111.

[4]Merchant, K., Shields, M.D., 1993, When and why to measure costs less accurately to improve decision making . Accounting Horizons,7(2):76-81.
 [5]Nicholls, B. , 1992, ABC in the UK- astute report. Management Accounting, 70(5):22-28.
 [6]Piper, J. A.,Walley, P., 1991, ABC relevance not found. Management Accounting. London,69(3):42-54.
 [7]Sievanen, M., Tornberg, K., 2002, Process - Based Costing: The best of Activity Based Costing, AACE. International Transactions, CSC.15:1-16.
 [8]Turney, P. B., 2010, Activity Based Costing: An emerging foundation for performance management. Cost Management. Boston, 24(4) : 33-42.

THE VISION ANALYSIS OF AGRICULTURAL PRODUCERS ON ROUTES OF MODERNIZATION AND DEVELOPMENT ON THE FARM IN ARGES COUNTY

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Key words: agricultural producers, Arges county, farms, modernization

Abstract

This paper aims to present an outlook for agriculture in terms of vision Arges farmers. In this paper going to disseminate some of the information obtained through questionnaires, evaluation of data from the survey was conducted the test of association, (Chi, Chi-square, χ^2 Hi or theoretically), waste is standardized (R), contingency coefficient C Pearson's correlation coefficient and Cramer's V. The purpose of the questionnaire was to identify farmers' opinion on the landform where the farms surveyed found the following aspect: the ways of upgrading deemed necessary to be implemented on farms in the county Arges. As a result of the survey revealed that farmers consider mechanization as a method of upgrading a 86%, the choice being influenced by the mechanization of farms located where one can find relief, followed by varieties (76%) and crop technologies (72%) as a method of upgrading but their choice is influenced by the relief where it is found located holdings held by respondents, this was observed by using nonparametric correlations.

INTRODUCTION

The main segment we provide food resources is agriculture, which has a vital role in the economy through agricultural production which are the source of food for mankind growing, given the demographic explosion in poorer countries, and also the raw material for a range of industries.

Currently, 60% of Earth's populations make a living directly from agriculture practice. However, agricultural development is conditioned by differences in geology, topography, climate and natural resources, and diverse regional activities, infrastructure and social customs [2].

Romania has about 14.6 million ha of agricultural land, of which about 9.4 million ha arable. With a share of agricultural area about 61% of the total, Romania is the first in the European Union [2].

Rural areas in Romania are a cardinal component of the overall evolution of the Romanian economy. Three rural resources

give the true extent of the need of restructuring agriculture and rural development in our country: usable agricultural area, agricultural employment (3.5 million) and the total area of the countryside (90% of the country) [8].

Committee on Agriculture and Rural Development of the European Council welcomes the report on the European Charter of rural areas, the rural areas of Europe represents 85% of its total area affect, directly or indirectly, more than 50% of the continent [15].

In Romania, a major issue, this diminishes the subsistence production in agriculture. About half of the agricultural land is worked in subsistence farms that maintain overall agricultural efficiency low. In 2011 it was estimated that approximately 3.5 million farms have land less than one hectare, which prevents them from accessing EU funds. Romanian agriculture are slowed performance and ownership fragmentation in small parcels, which requires merging their farms need large

areas to be able to move to a modern agriculture.

Prevails in our country with small holdings of 3.45 ha, which totaled about 98% of the total situation which is reflected in the Arges county. To achieve rational dimensions of rural farm coherent policies are required to support the formation and consolidation [1].

The current situation of Romanian agriculture is characterized by many social and economic problems, and the existence of many farms viable economically [3].

Picture ownership structures and exploiting of the Romanian agriculture is bipolarized, in terms of size and in terms of yields, weak productive. Bipolarity is shown by the coexistence of two categories of farms: small and large.

The category included small peasant holdings (can be found under the name of, the individual farm ").

On the opposite side are large farms, typically organized as units with legal personality: associations and agricultural cooperatives, businesses, etc. [13].

In both categories of production units are modest performance compared to the results of EU agriculture. Based on these general considerations and taking into account the experience and results developed European countries, we believe in Romania's agriculture, agrarian policy action is paramount in defining and sizing of the modern spirit farms.

In this context, we try to analyse which aspects of Arges County farmers consider important in order to increase production and profitability of farms they own considering using competitive varieties, irrigation, size, degree of mechanization and technology culture.

MATERIALS AND METHODS

Central objective of this research is the analysis of farmers on ways to modernize vision considered necessary to be implemented in the county of Arges, the factors that determine and influence on agricultural producers worldwide because

there is a tendency of concentration of agricultural production meet new production technologies [6].

This vision could be captured by application of two questionnaires: one for farmers and one for representatives of association of Arges County. To establish the statistical significance of the data collected by questionnaire Chi-square test was used.

The first phase covered before developing the questionnaire was such that the elements have been identified that would be obtained through questionnaires. It was also considered aspects: the purpose of the investigation, the territorial area of Arges County, location of farms according to the form of relief, asking questions, conducting surveys, analyses data from the questionnaires, and so on, and on this basis they structure was formulated questions and questionnaires.

Farmers questionnaire was applied during July to November 2011 in 34 communes of the 95 common as Arges county totals after the dominant landform lies villages questionnaires were applied:

- In 17 communes in the plains of the 32 communes are located in the plains of Arges;
- In 14 communes in the hills, of the 53 communes in the hilly ranges of Arges;
- In 3 common in the mountains, of the 10 communes in the mountain ranges of Arges.

People who have been interviewed representatives farms both legal form and the individual holdings without legal form.

In each village were applied by 3 questionnaires (if applicable), a total of 100 questionnaires farm in the county of Arges.

The questionnaire applied representatives of association was in the same period, a total of 25 questionnaires.

Evaluation of data from the survey was conducted the test of association, (Chi, Chi-square, χ^2 Hi or theoretically), this test involves checking the hypothesis of association between: a questionnaire responses from a question alternatives and verification of a particular set of data I can follow a known statistical distribution. The socio-economic problems after the composition is applied to contingency tables

in which data are categorized by one, two or more segmentation variables [12].

This test allows to highlight the existence/non-existence of a link between sub-collectivises association created segmentation variables studied.

Because the chi-square test expression is obtained from observations that is a statistic and therefore is not a parameter, so it is also called non-parametric statistical test or distribution free test, a test that does not depend on the form of the original law base [4].

According to the methodology for application of the test is based on the following assumptions:

- H_0 , between the observed and expected no significant differences, which implies that the two variables analysed are not related;
- H_1 , there are significant differences between observed and expected frequencies, which means there is a link between the variables analysed [17].

For example, the data obtained through the questionnaires, analyse the structure of respondents' opinion on ways to modernize farm development by landform located that match the holdings held by interviewees considered necessary to be implemented by the Arges County landform in this example we will analyse the manufacturers opinion on upgrading the varieties.

Null hypothesis H_0 wording, which states that the two variables are not questions segmentation causal or association;

X - consider varieties a method of upgrading your farm? (., yes., or., no.,).

Y - landforms, which are found holdings held by respondents (plains, hills, mountains).

Table 1. Contingency table of the variables X and Y for the observed

Specification	Yes	Not
Plain	42	9
Hill	33	5
Mountain	1	10

Source: Data processing by:., Questionnaire Arges county farmers association" [7];

The probable contingency table values (theoretical expected) is calculated from the frequencies actually incurred (observed) to the total responses. For example:

- The total number of subjects who agreed with the statement (da) is 76. Since in total there are 100 subjects who responded to the questionnaire, the percentage of those who agreed with the statement is 76/100, 76% of the group. Thus, if there is no difference between the group of respondents who own farms in the lowlands, the group of respondents who have holdings in the hill and the group of respondents who own farms in the mountains (the null hypothesis), then 76% of respondents who have farms in the lowlands ($0.76 \times 51 = 38.76$), 76% of respondents who own farms in the hilly ($0.76 \times 38 = 28.88$) and 76% of respondents who own farms in the hilly ($0.76 \times 11 = 8.36$) should be agreed with the statement (theoretical frequency) (Table no. 2.).

- The total number of subjects who agreed with the statement (not) is 24. Since in total there are 100 subjects who responded to the questionnaire, the percentage of those who agreed with the statement is 24/100, 24% of the group. Thus, if there is no difference between the group of respondents who own farms in the lowlands, the group of respondents who have holdings in the hill and the group of respondents who own farms in the mountains (the null hypothesis), then 24% of respondents who have farms in the lowlands ($0.24 \times 51 = 12.24$), 24% of respondents who own farms in the hilly ($0.24 \times 38 = 9.12$) and 24% of respondents who own farms in the hilly ($0.24 \times 11 = 2.64$) should be agreed with the statement (theoretical frequency) (Table no. 2.).

Formula's Chi-square (χ^2) [14]:

$$\chi^2 = \sum \frac{(O - E)^2}{E}$$

where:

- O = observed frequency (frequency effect occurs);
- E = Expect frequency (frequency probable theoretically expected frequency).

Table 2. Calculation of the expected theoretical frequencies

Specification	Yes	Not	Total
Plain			
Observed	42	9	51
Probable (theoretical expected)	38.76	12.24	
Hill			
Observed	33	5	38
Probable (theoretical expected)	28.88	9.12	
Mountain			
Observed	1	10	11
Probable (theoretical expected)	8.36	2.64	
Total	76	24	100

Source: Data processing by:., Questionnaire Arges county farmers association" [7];

Table 3. Calculation of Chi-square (χ^2)

O - E	(O - E)²	(O - E)² / E
3.24	10.50	0.27
4.12	16.97	0.59
-7.36	54.17	6.48
-3.24	10.50	0.86
-4.12	16.97	1.86
7.36	54.17	20.52
Calculated Chi-Square (χ^2)=		30.58***

Source: Data processing by:., Questionnaire Arges county farmers association" [7];

Note: (*) significantly distinct, (**) significant (***) very significant;

Choosing the materiality level or α and calculating the number of degrees of freedom of the table as [14]: $(r-1) * (c-1)$; (example: $(3-1) * (2-1) = 2$), where „r,, is the number of rows and number of columns is „c,, , on the basis of these data, it takes in the value of χ^2 distribution table, theoretical χ .

Searching the table of significance at $df = 2$ ($df =$ degrees of freedom), we see that $df = 2$ has a value of 9.21 at $p < 0.01$.

Comparing the results obtained [5] that there are situations:

- If the null hypothesis is rejected and so there is a potential association or relationship between variables;

- If it admits the existence of a null hypothesis and so there is an association or potential relationship between the variables studied.

The value obtained by Chi-square 30.58*** is very significant. This tells us that the null hypothesis should be rejected.

To determine which category made major contributions to achieving waste is calculated standardized differences (R). Formula is:

$$R = \frac{O - E}{\sqrt{E}}$$

This formula is applied in each situation. If waste is standardized is greater than 2 (in absolute value, regardless of sign) we believe that the item has brought an important role in obtaining a significant χ^2 .

Note the use of **chi-square test** (χ^2):

For tables of type 2 x 2 contingency is necessary to apply a correction, called Yates correction for continuity. It operates a decrease of 0.5 the difference between the observed and theoretical (expectations, probably) before picking up the square [14]:

$$\chi^2 = \sum \frac{(O - E - 0,5)^2}{E}$$

Also to evaluate the survey data were used and the contingency coefficient C and Pearson's correlation coefficient V of Cramer. These two factors similar functions and are used to identify the association between two nominal variables (categorical) whose conduct is greater than 2 x 2, can reach 10 x 10.

C contingency coefficient of Pearson's formula can be generalized to any number of rows and columns. To calculate the coefficient C but first we need to know the value of χ^2 . Deficiency of this factor appears to be the formula below and is that it can never take the value 1, even if a perfect combination. Thus, for a 3 x 3 table type, the maximum attained is 0.82, for a type 4 x 4 it reached 0.87. As the size of the table increases, the limit of C is moved to 1, so that the respective coefficient is recommended especially in the case of large contingency tables (rows or columns 7-8 of the above). Here's the formula C:

$$C = \sqrt{\frac{\chi^2}{N + \chi^2}}$$

To overcome this impasse the subunit value, Cramer Association proposes the following coefficient, size can achieve the value 1:

$$V = \sqrt{\frac{\chi^2}{N(s-1)}}$$

where are needed:

- χ^2 ;
- N - the total number of subjects in the study;
- s - the lowest number of rows and number of columns.

Interpretation of C, and V is theoretically based on the idea that an outcome as close to 1 indicates a positive correlation, and a negative coefficient indicates an inverse association. It can be said that the two variables there is an association.

RESULTS AND DISCUSSIONS

In this paper we analysed and interpreted some of the data obtained using a questionnaire that was applied to agricultural producers and the presidents of association, being pursued their vision on ways to modernize deemed necessary for the development of farms in the county of Arges. The results, in conjunction with theoretical analysis allowed pragmatic perspectives on agriculture in Arges county through the vision of farmers in the study.

Table 3. Structure of the opinion of chairmen of the forms of association on the means of modernization concerning the Increase development of exploitation in the year 2011

Specification	Unit Size	Yes	Not	Total	
		No.	No.	No.	%
Cultivars	Nr.	18	7	25	-
	%	72%	28%	-	100
Mechanization	Nr.	21	4	25	-
	%	84%	16%	-	100
Irrigation	Nr.	11	14	25	-
	%	44%	56%	-	100
Culture technology	Nr.	15	10	25	-
	%	60%	40%	-	100
	%	72%	28%	-	100

Source: Data processing by:., Questionnaire Arges county farmers association" [7];

Note: (*) significantly distinct, (**) significant (***) very significant;

Analysing data obtained on farmers' opinion and of association presidents about ways to

modernize the production and hence increase farm profitability, we find that they differ from the ways of upgrading their attention, such as:

- to upgrade competitive varieties using 76% of farmers were to use them and 24 % felt that the quality is not relevant varieties to increase farm profitability . Note that 72 % of the presidents of association surveyed agreed with the importance of varietal characteristics used and 28 % considered this issue irrelevant (Table 3 and Table 4).

- interestingly respondents answer on the implementation of the irrigation system as follows: 41% (or 44 %) felt that irrigation is a way to increase farm profitability and 59% (respectively 56 %) felt that they did not influence directly increase profitability (Table 3 and Table 5).

- to the size of farm mechanization level , we see that 86% of farmers (84% of presidents) considered beneficial activities increased mechanization of farms , and 14% (16%) considered irrelevant this to increase farm profitability (Table 3 and Table 6).

Table 4. Structure opinion on the varieties farmers as a way to modernize the farm in 2011

Cultivars					
After landform	Unit Size	Yes	Not	Total	
		No.	No.	Nr.	%
Plain	No.	42	9	51	51
Hill	No.	33	5	38	38
Mountain	No.	1	10	11	11
Total	No.	76	24	100	
	%	76	24		100
The Residue Standardized					
Plain	No.	0.52	-0.93		
Hill	No.	0.77	-1.36		
Mountain	No.	-2.55	4.53		
Calculated Chi-Square =	30.58***	Critical value (theoretical)=	1.39	p > 0.5(*)	
Degrees of freedom =	2		4.61	p > 0.1(**)	
Cramer's V =	0.55		9.21	p > 0.01(***)	
		Pearson's C =	0.48		

Source: Data processing by:., Questionnaire Arges county farmers association" [7];

Note: (*) significantly distinct, (**) significant (***) very significant;

- the relevance towards of quality crop technologies 72% (or 60 %) felt that they are essential in increasing the profitability of farms , and 28 % (respectively 40%) felt that they are not the deciding factor in increasing profitability (Table 3 and Table 7).

The statistical test of association on ways to modernize farm development by landform located that match the holdings held by interviewees noted that the modernization of the varieties depending on where they are located landform farms studied, it is found that there is a very significant association between farmers' opinion on the type of relief the problem analysed (chi-square = 30.58 ***; critical value = 9.21 at a probability <0.01), we see that the large distribution of respondents who consider a method of upgrading varieties are in the plains (42 respondents), and the analysis of R (standardized residual) significant differences are observed especially in terms of respondents who consider / not consider varieties method modernization with farms located in the mountains towards farms located in different areas of relief, however we were allowed to issue the conclusion that the method of upgrading choosing varieties for farm relief area is influenced by where they stand (Table 4).

Also the interpretation of Pearson's C, and Cramer's V, in this case it can be said that among the respondents' opinion on the varieties as a way to modernize the farm and location of farms owned by respondents (Pearson's C = 0.48, Cramer's V = 0.55), no association between the aspects considered, the method of choice varieties for agricultural modernization is influenced by the relief where they stand (Table 4).

The modernization by implementing irrigation by landform where farms are located studied, it appears that there is a significant association between farmers view (Chi-square = 6.25 **; critical value 4.61 at a probability <0.1), and the largest distribution of respondents who do not consider implementing a method of irrigation modernization in the lowlands (33 respondents), and the analysis of R (standardized residual) did not observe

significant differences in terms of respondents who consider / not consider implementing a method of irrigation modernization and relief area where farms are found respondents however allowed us to issue the conclusion that failure to elect the method of implementation of irrigation systems for agricultural modernization not influenced by the relief where they stand (Table 5).

Table 5. Structure opinion farmers on irrigation as a way to modernize the farm in 2011

Irrigation					
After landform	Unit Size	Yes	Not	Total	
		No.	No.	No.	%
Plain	No.	18	33	51	51
Hill	No.	21	17	38	38
Mountain	No.	2	9	11	11
Total	No.	43	57	100	
	%	41	59		100
The Residue Standardized					
Plain	No.	-0.64	0.53		
Hill	No.	1.37	-1.14		
Mountain	No.	-1.18	0.99		
Calculated Chi-Square =	6.25**	Critical value (theoretical)=	1.39	p > 0.5(*)	
Degrees of freedom =	2		4.61	p > 0.1(**)	
Cramer's V =	0.25		9.21	p > 0.01(***)	
		Pearson's C =	0.24		

Source: Data processing by:., Questionnaire Arges county farmers association" [7];

Note: (*) significantly distinct, (**) significant (***) very significant;

Analysing opinion on modernizing the mechanization of farms depending on where they are located landform farms studied, it appears that there is a distinct significant association between farmers view (Chi-square = 3.83 **; critical value = 1.39 at probability <0.5), and the largest distribution of respondents who consider mechanization method of upgrading is in the plains (47 respondents), and the analysis of R (standardized residual) is not observed significant differences in the respondents who consider / not consider a method of modernization and mechanization of the farms found relief where respondents however allowed us to issue the conclusion that the method of upgrading choice for mechanized

farming is not influenced by the relief where they stand (Table 6).

Table 6. Structure opinion on mechanization to farmers as a way to modernize the farm in 2011

Mechanization					
After landform	Unit Size	Yes	Not	Total	
		No.	No.	No.	%
Plain	No.	47	4	51	51
Hill	No.	31	7	38	38
Mountain	No.	8	3	11	11
Total	No.	86	14	100	
	%	86	14		100%
The Residue Standardized					
Plain	No.	0.47	-1.18		
Hill	No.	-0.29	0.73		
Mountain	No.	-0.47	1.18		
Calculated Chi-Square =	3.83*	Critical value (theoretical)=	1.39	p > 0.5(*)	
Degrees of freedom =	2		4.61	p > 0.1(**)	
Cramer's V =	0.20		9.21	p > 0.01(***)	
		Pearson's C =	0.19		

Source: Data processing by:., Questionnaire Arges county farmers association" [7];

Note: (*) significantly distinct, (**) significant (***) very significant;

The statistical test of association on ways to modernize farm development by landform located that match the holdings held by interviewees noted that the modernization of culture technologies depending on where they are located landform farms studied it appears that there is a significant association between farmers view by landform analysed the problem (Chi-square = 18.04, critical value = 9.21 at a probability <0.01), and that most distribution of respondents who consider a method of upgrading technologies is growing in the lowlands (39 respondents), and the analysis of R (standardized residual) significant differences are observed especially in terms of respondents who consider / not consider culture technologies a method of upgrading with farms located in the mountains to the farms located in different areas of relief, however we were allowed to issue the conclusion that the method of upgrading choosing varieties for farm relief area is influenced by where they stand (Table 7).

Table 7. Structure opinion farmers on crop technologies as a way to modernize the farm in 2011

Culture technology					
After landform	Unit Size	Yes	No.	Total	
		No.	No.	No.	%
Plain	No.	39	12	51	51
Hill	No.	31	7	38	38
Mountain	No.	2	9	11	11
Total	No.	72	28	100	
	%	72	28		100
The Residue Standardized					
Plain	No.	0.38	-0.60		
Hill	No.	0.70	-1.12		
Mountain	No.	-2.10	3.37		
Calculated Chi-Square =	18.04***	Critical value (theoretical)=	1.39	p > 0.5(*)	
Degrees of freedom =	2		4.61	p > 0.1(**)	
Cramer's V =	0.42		9.21	p > 0.01(***)	
		Pearson's C =	0.39		

Source: Data processing by:., Questionnaire Arges county farmers association" [7];

Note: (*) significantly distinct, (**) significant (***) very significant;

Also the interpretation of Pearson's C, and Cramer's V, in this case it can be said that among the respondents' opinion on the technologies of culture as a way of upgrading a holdings and location of farms owned by respondents (Pearson's C = 0.39, Cramer's V = 0.42), no association between the aspects considered, the choice of the method of culture technologies for agricultural modernization is influenced by the relief where they stand (Table 7).

CONCLUSIONS

1. After data analysis, it is noteworthy similarity with the farmers opinion presidents of association, given that they were interviewed separately by the two questionnaires.
2. By prioritizing the modernization of farm horses put to the attention of farmers, it appears that the method of upgrading mechanization choice (86%) were not influenced by the relief where farms are found placed, followed by varieties (76%) and technology culture (72 %) as the method of upgrading but their choice is influenced by the

relief where it is found located holdings held by respondents.

3. Interestingly, respondents answer on the implementation of the irrigation system as follows: 41% (or 44%) felt that irrigation is a way to modernize farms and 59% (respectively 56%) felt that they did not directly influence farm modernization.

REFERENCES

- [1] Bercu F., Micu M.M., Pătrașcu G., 2010, The influence of agriculture on climate change, Scientific papers , volume 25 (1), Economy, ISBN 978-9975-64-193-7, Ministry of Agriculture and Food Industry of Moldova, State Agrarian University of Moldova, Chisinau
- [2] Burcea, M., & Micu, M.M., 2010, Size and characterization of agricultural holdings in Romania reported in EU-27. Scientific Papers Series-Management, Economic Engineering in Agriculture and Rural Development, 11(1), 22-25
- [3] Dincu Ana-Mariana, Sâmbotin L., Mateoc-Sîrb Nicoleta, Găvruta A., Mănescu Camelia, 2008, Diagnosis farms in Romania, Scientific Papers – Volume 51, Agronomy Series, Iași
- [4] Iosifescu, M., ș. a., 1985, Minor statistical encyclopedia, Scientific and Encyclopedic Publishing, Bucharest
- [5] Merce, E., ș. a., 2010, Statistical analysis, Publisher AcademicPres, Cluj-Napoca, Romania
- [6] Micu M.M., 2012, Researches on the association of agricultural producers with a view to increase production and rentability. Case study Arges county'', Doctoral Thesis, Unpublished
- [7] Micu M.M., 2011, Questionnaire Arges county farmers association
- [8] Micu M.M., Tudor Valentina, Crețu Daniela, 2012, The impact on rural development programs on environment. Case study, common Dorobantu, county Calarasi, 19th International Economic Conference, IECS, The persistence of the global economic crisis: causes, implications, solutions, ISBN: 978-606-12-0323-9, University of Sibiu „Lucian Blaga”, Faculty of Economic Sciences, Sibiu
- [9] Micu, M. M., & Tudor, V., 2012, Distribution of farms and utilized agricultural area of Romania by the size classes according to legal personalities, Scientific Papers Series-Management, Economic Engineering in Agriculture and Rural Development, 12(1), 127-132
- [10] Micu, M. M., & Tudor, V., 2012, Vision analysis of Arges county farmers intend to associate and for what purpose, 3rd International Symposium "Agrarian Economy and Rural Development - realities and perspectives for Romania" (AERD 12), Bucharest, Romania, 11-13 October, 2012 pp. 232-239
- [11] Micu, M.M., Tudor, V., Sterghiu, N., & Pandelea, M., Study regarding the perspectives of Arges county agriculture through the farmers' vision, Scientific Papers, Agronomy Series, Volume 55, Issue 1, Print ISSN: 1454-7414, Electronic ISSN: 2069-6727, Publisher "Ion Ionescu de la Brad", U.S.A.M.V. Iași;
- [12] Mihăiță, N. V., 2012, Strong statistical relationship hidden, false and illusory, <http://www.biblioteca-digitala.ase.ro/biblioteca/carte2.asp?id=388&idb=>, access 04.07.2012
- [13] Popescu, G., 2007, Cooperation in agriculture, the land market in the transfer of knowledge, Publisher Terra Nostra, Iași
- [14] Sava F.A., 2002, Nonparametric techniques for comparison between groups, http://statisticasociala.tripod.com/non_par.htm, access 04.07.2012
- [15] Stefan P., Crețu R.C., Micu M.M., 2012, Economic crisis and the implications on rural tourism and sustainable development in Calarasi county, 19th International Economic Conference, IECS, The persistence of the global economic crisis: causes, implications, solutions, ISBN 978-606-12-0323-9, University of Sibiu „Lucian Blaga”, Faculty of Economic Sciences, Sibiu
- [16] Stoian, E., Toma Dinu, V. T., Micu, M. M., & Vlad, I. M. Analysis of the agricultural producers' vision in relation to farm development ways in Arges County. Data processing, 38, 23-56, Series Title: energy, Environmental and Structural Engineering Series, Book Title: Advances in Environmental Technologies, Agriculture, Food and Animal Science, Conference Titles 2nd International Conference on Agricultural Science, Biotechnology, Food and Animal Science (ABIFA'13), ISSN: 2227-4359, ISBN 978-1-61804-188-3, 2013
- [17] Tudor V., Sipică Al., 2012, Providing Online Information Service to Small Farm Owners, Studies in Informatics and Control, Volume 21, Issue 4.

EVALUATION ANALYSIS AND THE IMPACT OF ITS MONITORING

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Abstract

The evaluation of the research project is required in order to find out what works and what does not work in the project, to show to the financers the phase it is in and the benefits it brings to them in order to apply for potential supplementary funding, if necessary, to improve the participants' work. All the results should be assessed and analyzed taking into consideration the manner in which the funding is justified. In order to achieve this objective the monitoring of the research projects is a priority and plays an important role. This paper examines how the impact assessment and monitoring them following that through further studies to develop a model for assessing the economic value of research projects.

Key words: evaluation criteria, economic evaluation, project management

INTRODUCTION

For maximization of the evaluation benefits of the research project it is recommended to invest a lot in planning (time and effort), to integrate the evaluation in an activity in course in the project performance, the personnel participation and implication showing that this participation is important, their implication should be as earlier and as much as possible, to realistically deal with the problems occurred [1], [2]. The collection of necessary data for evaluation is made in a given time interval and provides information for supporting the continuation of recommendations, modification and/or cancellation of certain project activities and strategies [3].

MATERIALS AND METHODS

The study is based on the recent literature in the field and presents the authors' opinion on evaluation analysis and the impact on its monitoring. The types of evaluation and assessment monitoring were pointed out along the stages of a project.

RESULTS AND DISCUSSIONS

Evaluation and types of evaluation

Evaluation may be useful in many/multiple ways and it can provide critical data for taken a decision in all the phases of a project elaboration and implementation. The evaluation concepts [4] take into consideration the following:

-Process evaluation – the evaluation of the method in which the project was implemented and of the procedures by whereby the project operates

-Results evaluation – the quantification of results and their correlation with the project objectives

-Evaluation of needs – analysis of needs that stand upon the basis of the project and justify its existence

-SWOT analysis – analysis of strong and weak points, of opportunities and risks or the potential threats that may occur in the project implementation

-Cost-benefit analysis – reporting the costs involving the project to the benefits provided by the project; surveying the manner in which the costs generated by the project are depreciated in time

-Explanatory models – follow the project evolution from the moment of its drawing, during the implementation and after its implementation

-Systematic models – analyze the inputs, the structure, the processes and the outputs in terms of results

-Theory oriented models – assess the validity of the project theory

-The benchmarking – is an evaluation method based on the comparison principle between similar and comparable cases.

The evaluation criteria refer to: relevance, effectiveness, impact, sustainability [4]. The relevance refers to the measure in which the research project will meet the real needs, if the modifications correspond to the needs or to the objective, if the project meets the needs to which it proposes to answer. If the research project fails to meet the needs or covers them partially, it becomes irrelevant. The effectiveness refers to the measure in which the project reaches the proposed objectives. The degree in which the project results meet the needs represents a measure of effectiveness. The effectiveness also takes into consideration also the financial aspect, which means the degree in which the same results can be obtained with fewer resources. If the unit costs are too high for the objectives achieved, it analyzes if the project is too expensive to be continued. The impact represents the net effect caused by the project [5]. An accurate calculation in a complex social and economic context, is almost impossible, therefore it requires estimation, estimating the effects along the project. Sustainability refers to the project continuation after the interruption of funding from the initial source. If the project can continue after its completion and leads to further results, it means that the project has high efficiency. [6].

In addition to the five evaluation criteria we have to consider also the equity and the community involvement. The equity refers to equality in what concerns the access to the services provided by the project, without limits of the age, gender, material and social conditions. The community involvement is

considering the results obtained and their utility for the community by direct involvement. The evaluation types represent the theoretical perspectives that stand on the basis of the evaluation approach [4].

Evaluation can be in planning and summative and formative evaluation. The evaluation in planning analyzes the understanding of project goals, objectives, strategies and deadlines. Formative evaluation analyzes the project along its course. Starts in the moment of the launching and continues during the period of the project providing information for the project improvement. This evaluation type has two sections: evaluation of the implementation and evaluation of the progress. The evaluation of the implementation estimates the manner in which the project complies with the plan and can be made once or several times during the course of the project [4]. Before evaluating the results it should be analyzed if the project is truly operational and works according to its description or plan [7]. The assessment of progress made in the achievement of the project goals and consists in collecting information in order to find out if the progress reference points have been achieved and for emphasizing the unexpected evolutions. The summative evaluation analyzes the success of a project and takes place after making the changes, the project is stabilized and the project impact is set up. This type of evaluation collects the information related to processes, impacts and results [4].

For the evaluation on international plan, the Evaluation Standards are used [8]. These standards are useful, feasible, decent, precise and responsible. The evaluation should be made by qualified persons in order to maintain the credibility of evaluation, to be noticeable for the stockholders or investors who evaluate them.

The evaluation goal should be identified well and settled on the basis of the established needs, should clarify and specify the individual values that stand on the basis of the processes and objectives. It also should identify the urgent needs of the persons evaluated, to determine activities and

reasoning that encourage the participants to innovate and understand the behavior, the goal and the problems [9]. The evaluation should lead to permanent information, to promote the responsibility and adjustment to the modifications produced by evaluation. The evaluation must use strategies, the procedures should be practical, in order to protect the demands of the evaluated individuals or the project goals, should offer complete information about acknowledgments, limitations and conclusions and to serve its purpose [10].

In order to evaluate the directions in research way the following criteria were analyzed [11]:

1. Scientific performance [11]

This criterion is determined by the question: "What is the new achievement from the conceptual perspective?" and refers to the new and original results quantifiable by means of scientific publications, thus assuring the visibility of the research in the intern and international scientific community.

2. The human potential [11]

Thus we answer the question: "Who obtained the results?" emphasizing the quantity and quality of the human resource currently involved or available in the field of research.

The human potential mainly determines the elaboration of the strategy.

3. The research infrastructure [11]

Question: „What technical means were used in order to obtain the result?“ shows the quantity and quality of existing or utilized research infrastructure: installations, laboratories, equipment. The infrastructure contributes to the training of specialists, and to the attraction and maintenance of the human resource.

4. Competitive funding [11] (Buzatu, 2010)

This criterion is determined by the question: „With what funds were the results obtained?“ and refers to the capacity of the specialty personnel to attend to project competitions in order to attract the necessary funds for the research planned. The capacity to propose and win projects determines the assurance of appropriate funding and contributes to the research field development.

5. The social and economic impact [11]

„Who will benefit from the research results?“ The question considers the contribution of the research in different domains of activity by means of patents, applied technologies, services, professional training.

This is a highly important criterion to be considered in taking the decisions related to the scientific research.

The financial analysis of each project has as objectives: the calculus, the performances and the financial sustainability of the proposed investment and settling the best funding structure, including the optimal level for co-funding from public funds [12], [13], [14].

The assessment of the cash flow for the whole reference period determines the accuracy of performance indicators. Methodology of updated cash flow is based on several practices, which are [15]:

-only the effective cash flows are taken into consideration, being removed the non-monetary flows (accounting flows) as depreciations and provisions;

-the values are incrementally determined and are calculated considering the updated value, thus the future cash flows during the entire period of investments will be reflected at the present value [15].

Currently evaluating research projects are limited to a small number of indicators without taking into account the sustainability of research results. The analysis focuses on research results (books, patents, prototypes, etc) for each type of result, depending on the life cycle of the outcome, the time required to obtain results, taking into account the some results are not obtained immediately. The impact of the results on the economic and social life and its applicability should be analyzed while budgeting a research project. Valuation models should include clear end essential elements of the project, should consider the multiplier effect on the result [16].

Evaluation monitoring

Monitoring and evaluation allow for the revision of the progress, the identification of the problems that appear in planning and implementation, the correction of the potential

errors occurred. The monitoring involves as follows: establishing a system of collecting information related to these indicators; information collection and registration; information analysis; utilization of the information in management [17].

Evaluation involves: establishing the objectives of the project and the impact desired; estimation of the progress considering the objective and the set up impact; analyzing the manner in which the project objective corresponds to the organization's strategy; analyzing how it works; evaluating the cost efficiency and opportunity; what are the implications for the chosen option [18].

In order to choose the indicators for the evaluation of a project, the following steps should be considered [19]:

- Identification of the problem that will be solved using the research result;
- Development of the problem we wish to solve, thus we establish the impact indicators;
- Development of a procedure related to the manner in which we wish to solve it, by using the process indicators;
- Development of the efficacy indicators;
- Development of indicators for the efficiency targets.

The monitoring and evaluation process requires a combination of quantitative and qualitative information. The methods of collecting information must be conceived according to the project. The collected information should be representative and organized in order to provide easy access. For the economic analysis of the project we can use information extracted from reports, statements, protocols, annual accounts, case studies, notes, journals, questionnaires, interviews, examples, statistical data etc.

The monitoring system takes into consideration the data collection, concepts definitions, setting up the indicators, the manner of the data are collected and their analysis. The monitoring and evaluation will have small value if the organization or the project is not using the information resulted from data analysis [19].

After obtaining the information, these information must be used for taking decisions related to the projects, utilization of the results, execution of the required modifications [19]. Monitoring and evaluation are parts of the project management and have the purpose to help in the process of using resources and in the activities in order to provide a continuous development of the results both on short and long term [20]. The impact involves the coordination of all available means in order to obtain durable results, which means that the inputs cause outputs, and the outputs establish the impact. The results are represented by the noticeable changes that may accompany the project. Usually, the results are reported to the desired impact and to the objectives described into the project.

The impact represents positive or negative, primary or secondary effects, that on long terms are determined by a direct or indirect intended involvement in development. The impact is related to the objectives provided into the project. Sometimes, it can be noticeable only after a few years and usually it is not achieved during the life cycle of the project [21].

The economic or commercial impact is obtained by means of technological transfer of the research result (patents, prototypes etc.), thus obtaining new products, profit, new business, etc. The impact of the research consists in resource or time saving, risks reduction, productivity and competitiveness growth, cost reduction, improvement of the production process and efficiency, increased employee number, increased investments, etc. [21]. A project should have results and the results should cause an impact on the development. Due to several big changes in the long time development, influenced by many factors, usually it is impossible to assign an impact to a single project. The project monitoring focuses on the activities and results and on the contribution in achieving the results. The monitoring represents a continuous surveillance of a project progress by systematically collecting

the performance key data used for periodical analysis.

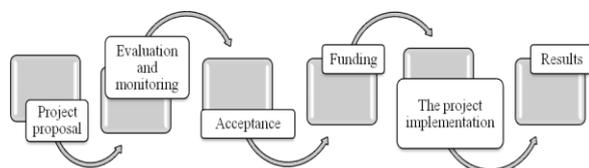


Figure 1. The stages of a project

Evaluation and monitoring are a priority for the success of a project (Fig1.) The funding and the implementation of a project are depending on the conduct of the evaluation.

The „ILO Technical cooperation manual-version 1” [22] categorizes the evaluation in 4 categories: individual evaluation made by the company’s personnel that involves low costs; internal evaluation made by the company’s personnel not involved into the project that involves average costs; independent evaluation made by independent evaluators that may be from the company but not involved in the project; external evaluation made by external evaluators outside the company. This type of evaluation involves the highest costs [22].

CONCLUSIONS

Evaluation of the research projects during their performance and from the perspective of the exploitation of the results of research can contribute to an efficient funding. The advantage of monitoring is noticeable in optimization of indicators during their execution and in the results optimization. The recovery of the investment in a research project can be found under various forms, and by monitoring we can early follow the efficiency of a research project. It is essential to analyze research projects both during and following their progress. The study will create an evaluation model that allows a quick assessment of a project and an efficiency budget allocation.

ACKNOWLEDGMENTS

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REFERENCES

- [1]***Economic Evaluation of Mining Projects, ISSUE NO. 71, — October 2005, Copyright 2005 by Pincock, Allen and Holt, a division of Runge Inc, [Accessed 13 June 2011], (2005a).
- [2]*** 2011-13 Capital Projects Evaluation System: Four-Year Higher Education Institutions Project Evaluation Guidelines And Application Instructions Budget Division, Office of Financial Management, State of Washington, May 2010, [Accessed 13 June 2011], (2010).
- [3]Braun M., Lepori B., Reale E., Slipersaeter S., Kaloudis A., Filiatreau G., Larédo P., Tools and Indicators for Community Research Evaluation and Monitoring, European Commission - DG Research, [Accessed 23 May 2011], (2009).
- [4]Gârboan R., Metode utilizate în evaluarea programelor: Analiza impactului social, http://www.apubb.ro/wp-content/uploads/2011/02/Metode_utilizate_in_evaluarea_programelor.pdf, [Accessed 20 April 2011], (2011).
- [5]***Findings on the impact of wind turbines on residential property values: A reference Guide as of 2011, Center For Business and Economic Research, Marshall University, [Online] Available at: http://muwwwnew.marshall.edu/cber/research/WTGs_Property_Impacts_Summary_FINAL.pdf [Accessed 05 September 2011], (2011e).
- [6]***National and Regional Economic Impacts of Engineering Research Centers: A Pilot Study, [Online] ,Engineering Education and Center Division, National Science Foundation, November 2008, Available at: http://www.sri.com/sites/default/files/brochures/erc_impact_final_report_11_18_08.pdf , [Accessed 05 September 2011], (2008).
- [7]***Earned Value Management, [Online], Available at: http://www.hyperhot.com/pm_cscs.htm, [Accessed 13 June 2011], (2005).
- [8]Yarbrough, D. B., Shulha, L. M., Hopson, R. K., and Caruthers, F. A., The program evaluation standards: A guide for evaluators and evaluation users (3rd ed.). Thousand Oaks, CA: Sage, (2011).

- [9] Inderst R., Innovation management in organizations, *European Economic Review* 53 (2009) 871–887(2009)
- [10] Mirza F., Mathematics, Operations Research, Statistics and Information System for Management (MOSI), Vrije Universiteit Brussel, Etterbeek Campus, Pleinlaan-2, 1050, Brussels, [Accessed 13 June 2011], (2008).
- [11] Buzatu F.D., The Evaluation of Romanian research potential in physics and the execution of international cooperation strategy – The potential of the Romanian departments for research in physics, ESFRO project financed by the National Authority for Scientific Research within the Regional Program of the Ministry of Education, Research, Youth and Sport, agreement no 2S/31.08.2009, [Accessed 26 April 2011], (2010).
- [12] ***Introduction to break-even analysis, [Online], Available at: http://www.tutor2u.net/business/production/break_even.htm, [Accessed 05 September 2011], (2011a).
- [13] ***Project Management Software, [Online], Available at: <http://www.thesoftwarenetwork.com/Project-Management-Software/overview.htm>, [Accessed 05 September 2011], (2011b).
- [14] ***Project Timeline Management with Gantt Charts, [Online] Available at: http://www.envisionsoftware.com/articles/Gantt_Chart.html, [Accessed 05 September 2011], (2011c).
- [15] ***Ghidul solicitantului, Programul Operațional Sectorial „Creșterea Competitivității Economice POS CCE” 2007-2013 Axa prioritară (The applicant guide, the Operational Regional Program “The increase of economic competitiveness POS CCE”2007-2013 The priority axis) (AP) 4, , [Online], Available at: http://www.fonduri-e.ro/res/filepicker_users/cd25a597fd-62/Finantari/POSCCE/DMI_4.1_Cresterea%20eficientei%20energetice/O411_Eficienta_Energetica/Ghid_Eficienta_Energetica-mar.2012-onsultare%20Publica.pdf [Accessed 24 October 2010], (2011d).
- [16] Suărășan M.M, Nicoară F.D, Maier A., Research project evaluation, *Review of Management and Economic Engineering*, 2012, vol. 11, nr 4(46),167-176, (2012).
- [17] ***Guidelines for Financial and Economic Evaluation of New Water Infrastructure in Queensland, Resources and Industry Division, Queensland Treasury, , September 2000, [Accessed 13 June 2011], (2000).
- [18] *** Transportation Cost and Benefit Analysis II – Economic Evaluation Victoria Transport Policy Institute, (www.vtpi.org), 2 January 2009 Available at: www.vtpi.org/tca/tca03.pdf , [Accessed 02 May 2011], (2009).
- [19] ***Monitoring and Evaluation, [Online], Available at: <http://www.civicus.org/new/media/Monitoring%20and%20Evaluation.pdf>, [Accessed 24 October 2010], (2010a).
- [20] Verma D., Mishra A., Sinha K. K., The development and application of a process model for R&D project management in a high tech firm: A field study, *Journal of Operations Management* xxx (2011) xxx–xxx, (2011).
- [21] ***NASA Cost Estimating Handbook, , [Online] Available at: http://ceh.nasa.gov/webhelp/files/Cost_Estimating_Handbook_NASA_2004.htm [Accessed 05 September 2011], (2004).
- [22] ***ILO Technical cooperation manual-version 1, [Online], Available at: http://www.ilo.org/public/english/bureaupardevdownloaddevelopmenttcmanual_chapter7.pdf, [Accessed 24 October 2010], (2010b).

STUDY ON THE PRESENCE OF ANTIBIOTIC RESIDUES IN HONEY INTENDED FOR PUBLIC CONSUMPTION

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Abstract

The purpose of this paper is to highlight the presence of antibiotic residues in honey sold for human consumption. Specific objectives relates to the determination of residues of streptomycin, tetracycline and erythromycin in 18 samples of different types of honey, such as: acacia honey, linden honey and polyfloral honey. Honey was purchased from Bacau County, in 2012, from the following localities: Moinești, Onesti and Bacău. Antibiotic residues were determined with the RIA - Charm II test. The results revealed the existence of streptomycin residues in all samples of analyzed honey, above the permissible limits (40 ppb), except linden honey samples from Bacău. Tetracycline residues were found in all samples, the limits were exceeded only for acacia honey from Moinești and linden honey from Onești. Erythromycin residues have not exceeded the limits admitted to any sample, but they showed great variability. In conclusion, at the county level, all types of honey often contain residues of antibiotics, although European rules on consumer safety forbid adding them for prevention. The danger of toxicity is evidenced by the existence of several types of antibiotics in the same batch of honey, regardless of their concentration, due to their potential synergistic effect.

Key words: antibiotics, honey, residues

INTRODUCTION

The honey bee has earned the reputation of a „healthy” product for its beneficial properties in food area, medicine, cosmetic industry. Honey is a delicious source of carbohydrates, it is easy to digest, providing quick energy [2, 3, 6, 7]. The main types of honey are: monofloral honey, polyfloral honey and forest honey [5].

Examination of honey is done for: appreciation of quality and purity, state of degradation or adulteration, forgery detection. Examination of honey consists in sensory analysis and specific laboratory tests which must comply with quality and food safety. For this it is necessary to verify compliance with the limits of some toxic substances, set by the European Union, including antibiotics [1]. Contaminating honey antibiotics (streptomycin, tetracycline, erythromycin etc.) are used excessively in the practice of beekeeping in order to combat / prevent a disease or as stimulators [10].

Antibiotic residues in honey are banned in our country, because it can create over time a

particular organism resistance to this kind of drugs [12]. In addition to antibiotic resistance, clinical studies have associated a number of disorders (irritation, dermatitis, anemia, fetal malformations etc.) with the presence of antibiotic residues in products for public consumption [9, 11].

The purpose of this study is to determine by laboratory methods antibiotic residues in different types of honey for public consumption in 2012. Specific objectives: analysis of the residue of streptomycin, tetracycline and erythromycin in samples of acacia, linden and polyfloral honey, also a toxicological evaluation of differences, on antibiotic content, between categories of analyzed honey and areas in which they were purchased.

MATERIALS AND METHODS

Control of bee products is regulated worldwide by FAO Committee/O.M.S. Authorized organizations have established maximum limits for residues of antibiotics in

honey intended for public consumption. In Romania, drug residues and maximum quantities allowed in food are subject to EC Directive EWG 2377/90, as amended in 2002 by Directive EG 1752/2002 [4, 8]. Table 1 notes max permissible limits of antibiotics in honey.

Table 1. Maximum limits of antibiotics in honey (ppb) (F.A.O/ OMS, European Honey Directive of the European Honey Commission)

Analysed parameter	EU Standard (European Honey Directive of the European Honey Commission)	International Standard (Codex Alimentarius Standard of F.A.O. / O.M.S Commission)
Chloramphenicol	Absent	Absent
Nitrofuran	Absent	Absent
Streptomycin	Absent / allowed (40)	Absent / allowed (40)
Tetracycline	Absent / allowed (20)	Absent / allowed (20)
Sulphonamides	Absent / allowed (10)	Absent / allowed (10)
Erythromycin	Absent / allowed (20)	Absent / allowed (20)
Penicillin V	Absent	Absent
Penicillin G	Absent	Absent
Oxacillin	Absent	Absent
Ampicillin	Absent	Absent
Ciprofloxacin	Absent	Absent

For the analysis were taken the following samples of honey: in December 2012 were purchased from retail trade units from 3 localities of the County of Bacău (**Bacău, Moinești, Onești**), a number of six (6) jars of honey, **acacia honey, linden honey and polyfloral honey**, in order to determine the concentrations of antibiotics. From each bottle was taken a sample, resulting **18 (3 x 6) samples** that were introduced in the analysis for each type of honey. Antibiotic residues were analyzed in the laboratory of residues SVL Bacău (State Veterinary Laboratory), which belongs to Sanitary-Veterinary and Food Safety Direction of Bacău.

Determination of antibiotic residues in honey is done using RIA test-Charm. The procedure establishes how to carry out the determination of residues of streptomycin, tetracycline and erythromycin in honey. During the procedure, were followed the guidelines established by the laboratory

"Working Protocol - II Charm Streptomycin Test for Honey, Charm II Macrolide Test for Honey, Charm II Tetracycline Test for Honey".

RESULTS AND DISCUSSIONS

Antibiotic residues found in honey from Bacău county (Moinești, Onești, Bacău) and county average are presented in Table 2.

Table 2. Antibiotic residues in honey analyzed in Bacău county (ppb)

Antibiotic	Locality	$\bar{X} \pm s_{\bar{x}}$	CV%
Acacia			
Streptomycin	Bacău	57,00 ±6,72	11,8
	Moinești	54,00 ±0,14	27,34
	Onești	41,66 ±13,66	32,78
	Bacău County	50,88	-
Tetracycline	Bacău	17,50±2,88	16,49
	Moinești	20,17 ±3,18	15,81
	Onești	14,16±3,76	26,56
	Bacău County	17,27	-
Erythromycin	Bacău	0,33±0,15	45,94
	Moinești	0,23±0,05	24,89
	Onești	0,25±0,00	-
	Bacău County	0,27	-
Linden			
Streptomycin	Bacău	32,50±10,83	33,35
	Moinești	48,33 ±8,75	18,11
	Onești	47,50 ±8,21	17,29
	Bacău County	42,77	-
Tetracycline	Bacău	15,00±5,47	36,51
	Moinești	19,83±2,71	13,68
	Onești	20,16 ±2,56	12,70
	Bacău County	18,33	-
Erythromycin	Bacău	0,25±0,07	28,28
	Moinești	0,10±0,00	-
	Onești	-	-
	Bacău County	0,11	-
Polyfloral			
Streptomycin	Bacău	57,83 ±2,22	3,85
	Moinești	45,83 ±13,19	28,79
	Onești	50,83 ± 14,63	28,78
	Bacău County	51,49	-
Tetracycline	Bacău	10,66±3,32	31,18
	Moinești	16,83±1,47	8,74
	Onești	12,16±3,48	28,66
	Bacău County	13,21	-
Erythromycin	Bacău	-	-
	Moinești	0,20±0,00	-
	Onești	-	-
	Bacău County	0,06	-

Streptomycin concentration exceeded the permissible limits in all types of honey and in all places, except linden honey purchased

from Bacau. Streptomycin county averages in all types of honey have been raised above the permissible limits. The coefficients of variability, with few exceptions, were also large, proving that additions of antibiotics are chaotic and without respecting sanitary regulations.

Regarding **tetracycline**, the average values are below the limit of legislation at all types of honey, except acacia honey from Moinești and linden honey from Onești, which averages slightly exceeded the limit. The average county values comply with the law.

The average values of **erythromycin** have not exceeded the limits allowed, in any type of honey, regardless of the location from which honey was purchased. Similarly, the average county falls within limits.

Figure 1 shows a comparative differences observed in average antibiotic concentrations, between acacia honey purchased from: Bacău, Moinești and Onești and county average.

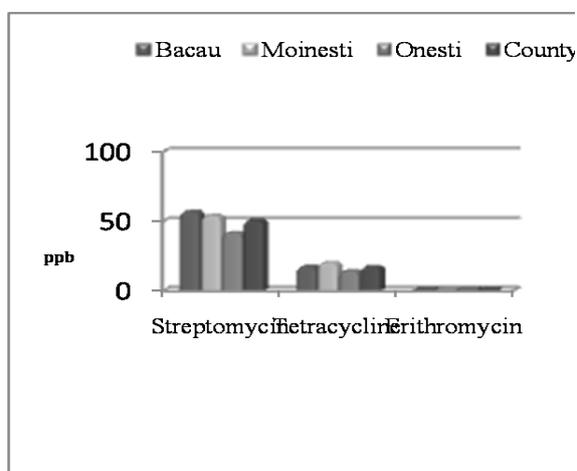


Fig. 1. The average values of antibiotics in acacia honey from different locations compared to the average county

From the above figure it is observed that streptomycin contaminates all lots of acacia honey that were analyzed from the localities. Erythromycin and tetracycline are not, apparently, a danger of contamination of honey, any local or county level. The danger of toxicity is evidenced by the existence of several antibiotics in the same batch, regardless of their concentration, due to their

potential synergistic effect. Also, by repeated ingestion of honey contaminated with three types of antibiotics, in time, the human body can reach a certain type of resistance, and when it becomes necessary to use an antibiotic, the body no longer responds to treatment.

Figure 2 shows a comparative differences observed in average antibiotic concentrations, between linden honey purchased from: Bacău, Moinești and Onești and county average.

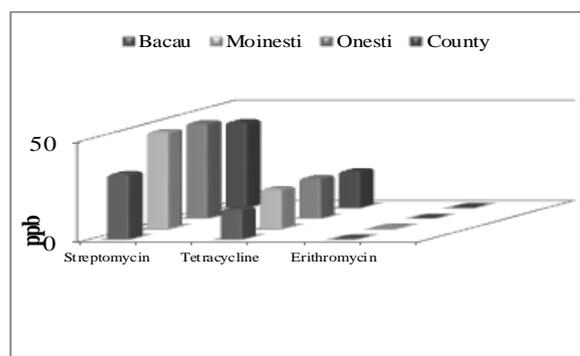


Fig. 2. The average values of antibiotics in linden honey from different locations compared to the average county

From the above figure it is observed that streptomycin contaminates all lots of linden honey that were analysed, in localities and at the level of the county. Tetracycline does not endanger the county, although locally (Onești 20,16 ppb) there is a small excess of maximum limits. Erythromycin is the only antibiotic that apparently is not a danger of contamination for honey, no local or county level.

Figure 3 shows a comparative differences observed in average antibiotic concentrations, between polyfloral honey purchased from: Bacău, Moinești and Onești and county average.

From figure 3 we observed that streptomycin contaminates all groups of polyfloral honey that was analysed in localities and county level. Tetracycline and erythromycin are no danger of contamination for honey, no local or county level. The danger of toxicity is evidenced by the existence of several antibiotics in the same groups of honey. The

use of antibiotics help beekeepers in the treatment of disease and prevention, so as to avoid getting sick, they frequently use antibiotics, in order to ensure that the production of honey will be bigger.

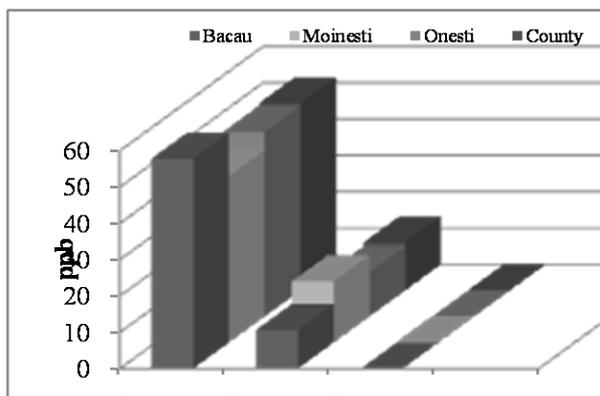


Fig. 3. The average values of antibiotics in polyfloral honey from different locations compared to the average county

CONCLUSIONS

The average values of **streptomycin** residues have exceeded the maximum permissible limits (40 ppb) in all types of honey (acacia, linden, polyfloral) purchased from localities Moinești, Onești and Bacău, as well as at the level of the county;

Tetracycline residues were detected in all types of honey purchased from Moinești, Onești and Bacău, but their average value exceeded the permissible limit (20 ppb) only for acacia honey (20,16 ppb) from Moinești and linden honey (20,16 ppb) from Onești;

Erythromycin residues were below the permissible limits, at all three types of honey and in all places in which honey was purchased;

It appears that in all the county the honey production, regardless of range (acacia, linden or polyfloral), contains **residues of antibiotics**.

The results of the study show clearly that although in our country it is currently forbidden to use streptomycin, beekeepers have added antibiotics (mainly streptomycin) in sugar syrup used in stimulate feeding from the spring, either to prevent the occurrence of diseases in bees, either to stimulate the queen.

The danger of toxicity is evidenced by the existence of several antibiotics in the same batch of honey, regardless of their concentration, due to their potential synergistic effect. Also, through repeated ingestion of honey contaminated with three types of antibiotics, in time the human body can reach a certain type of resistance to them. Although there are rules that determine the allowable limits of antibiotics in honey, these are not respected, which is why the honey exports from Romania to the EU fell due to abusive use of antibiotics.

REFERENCES

- [1]Băzgan O., 1999, Diagnostic de laborator și igiena alimentelor de origine animală, Editura Moldogrup, Iași;
- [2]Dabija P., Harnaj A., 1968, Producerea mierii pe secțiuni, Editura Apimondia, București;
- [3]Frisch, 1934, 1965, citat de Winston, 1993, Cartea stuparului, Editura Agro-Silvică, București;
- [4]Greuc I., Curea E., 1980, Identificarea substanțelor medicamentoase, Editura Dacia, Cluj-Napoca;
- [5]Lampeitl F., 2002, Albinăritul pentru începători, Editura Mast, București;
- [6]Mărghitaș L. A., 2007, Albinele și produsele lor, Editura Ceres;
- [7]Mârza E., Popa A., 1966, Cartea apicultorului, Editura Agro-Silvică, București;
- [8]Näumann G., Mahrt E., Himmelreich A., Mohring A., Frerichs H., 2012, Traces of contamination-well preserved in honey, Journal für Verbraucherschutz und Lebensmittelsicherheit, Volume 7;
- [9]Sánchez-Brunete C., Albero B., Miguel E., Tadeo J. L., 2005, Rapid Method for Determination of Chloramphenicol Residues in Honey Using Gas Chromatography-Mass Spectrometry, Department of Environment, National Institute for Agriculture and Food Research and Technology (INIA), Spain;
- [10]Sapna J., Nimisha J., 2010, Antibiotic Residues in Honey, CSE India;
- [11]Slebioda M., Barganska Z., Namiesnik J., 2011, Determination of antibiotic residues in honey, Trends in Analytical Chemistry, Vol. 30, No.7;
- [12]***www.sciencedirect.com

WESTERN CARPATHIAN RURAL MOUNTAIN TOURISM MAPPING THROUGH CLUSTER METHODOLOGY

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Abstract

Rural tourism from Western Carpathian Mountain was characterized in the last years by a low occupancy rate and a decline in tourist arrivals, due, beside of the direct effects of economic crises, to the remote location of mountain villages and to the low quality of infrastructure. For this reason we consider that the implementation of complex and integrated products based on tour thematic circuits represents a real opportunity to develop local rural tourism industry. The aim of this paper is to identify which is the best networking solution, based on clustering analysis. The Multidimensional Scaling Method and Hierarchical Cluster Method permitted us to demonstrate and identify the best way of clustering, and, in this way, the best route for a potential tour touristic circuit. Reported to the counties from which the villages take part, the identified cluster concentrate 57.7% of rural touristic accommodations and 65.0% of tourist arrivals, but it has an occupancy rate of only 5.9%. By implementing new complex touristic products we consider that can be assured a rise of this touristic dimension of the cluster and we propose more in depth studies regarding the profile of the potential customers.

Key words: commercialization, price volatility, supply chain, vegetable

INTRODUCTION

The rural tourism services from mountain areas permit to “take advantage of the mountain’s resources” by “preserving ecological processes and helping to conserve the natural heritage and biodiversity” [1], but the development of this touristic sector is affected directly by the “feminized or averaging advanced age” of population [6] and especially by the “lack of investment capitals, the slow evolution of touristic infrastructure development projects and the weak promotion of touristic resources”[3]. Despite this problems rural tourism, and especially agrotourism, offer structured services very diversified based on different forms of tourism (holiday, cultural tourism, health care etc.) [2]. One important aspect remains the absence of thematic touristic or integrated products. The existence of these types of products is essential for the enhancement and promotion of rural tourism and for the improving of visibility on the market. A viable solution to implement these

products is by tourism clustering which means to accumulate “tourist resources and attractions, infrastructures, equipment, service companies, other supporting sectors and administrative organism whose integrated and coordinated activities allow providing the customers with the experience they expect” [7]. Identify the best way of clustering the villages with touristic activities permits the enhancement of productivity, improves competitiveness performance, stimulates the development of new businesses and permits creation of added value on the entire touristic chain. These types of clusters can implement and promote complex, thematic and integrate touristic products.

MATERIALS AND METHODS

The main purpose of our research is to identify the best way to form touristic clusters in mountain areas, and especially in Western Carpathian. The methodology we used is a step by step approach: *Step 1*-we identified the rural villages situated in Western

Carpathian which have statistical recorded touristic activities. We realized this selection based on the villages geographical profile establish by National Research and Development Institute for Soil Science Agro-Chemistry and Environment Bucharest (NRDISSAEB) (mountain and partial mountain villages) [9] and based on the record of tourist arrivals from National Institute of Statistics (NIS). **Step 2** - the next step was to identify through statistical methods (that permit the mapping of tourist destinations in a designated territory [4]) the number of touristic clusters in which can be grouped the selected villages based on the distanced between variables. We realized this analysis based on the methods provided by Statistical Package for the Social Sciences (SPSS), respectively: ASCAL – this method permits a visualisation of clusters through multidimensional scaling (MDS); Hierarchical Cluster Method (HCM) – this methods establish the proper number of cluster based on the proximity between villages (Centroid Linkage option). **Step 3** – depending on the number of identified groups we will identify the village center of this clusters, respectively which village has a better dispersion. We realized this analysis based on two methods: Inverse Distance Weighted (IDW) and Average Distance Weighted (ADW) [5]. **Step 4** – evaluation of touristic activities inside cluster periods and the principal touristic objectives that can be promoted at that region level [8].

RESULTS AND DISCUSSIONS

Western Carpathian Mountains are formed from three major distinct group of mountains (Apuseni Mountains, Poiana Ruscă Mountains and Banat Mountains) and contain 18 mountain subgroups (Culmea Codrului, Muntele Şes Mnt., Meseşului Mountains, Clujului and Dejului hills, Trascăului Mountains. Metaliferi Mountains, Muntele Mare Mnt, Pădurea Craiului Mountains, Vlădeasa Mountains, Bihor Mountains, Zărandului Mountains, Poiana Ruscă Mountains, Lipovei hills, Almăjului

Mountains, Semenic Mountains, Aninei Mountains, Dognecea Mountains, Codru Moma Mountains [10]. They are from an administrative point of view spread on the territory of five counties: Alba, Arad, Cluj, Hunedoara and Sălaj.

In the areas mentioned above we identified 25 rural villages and 4 cities that present a preponderant mountain relief and which present touristic activities (Table 1):

Table 1: Cities and villages from mountain areas - western Carpathian

County	City/Rural village
Alba	Abrud City, Cămpeni City, Albac, Arieşeni
Arad	Hălmăgel, Halmagiu, Moneasa
Cluj	Băișoara, Beliș, Călațele, Căpușu Mare, Ciucea, Gilău, Măguri-Răcățiu, Margău, Marișel, Poieni, Rîșca, Săcuieu, Sâncraiu, Savadisla, Valea Ierii
Hunedoara	Brad City, Teliucu Inferior, Zam
Sălaj	Zalău, Buciumi, Meseșeni de Jos, Românași

Source: selection based on NRDISSAEB and NIS data

Starting from these rural villages we created a matrix of distances between localities to which we applied ALSCAL method. The multidimensional scaling permitted us to visualize possible clustering solutions (Fig. 1)

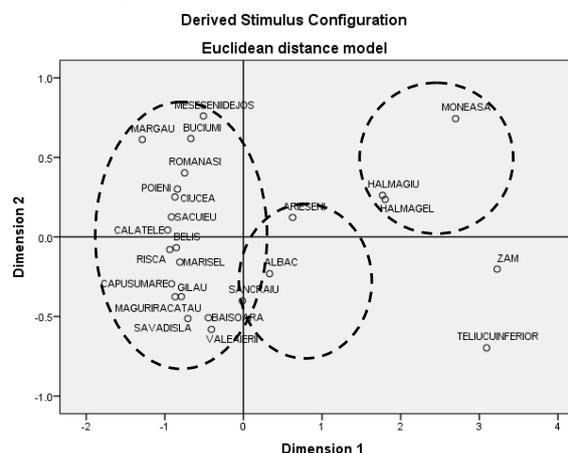


Fig. 1. Derived stimulus configuration + Euclidian distance

The ALSCAL method revealed us the possibility to group the localities in three clusters. Due to our aim to identify possible grouped touristic regions we exclude in this step the remote villages Zam and Teliucu Inferior (two villages can't form in our opinion a touristic region). In this condition we performed a hierarchical cluster analysis (HCM method) selecting the distances matrix formed by the other 23 villages.

We selected Squared Euclidean distance method of determining distance between clusters, the Centroid linkage method for clustering and the solution of three clusters. The new results obtained, based on the optimal distances show us the following distribution inside the clusters (Table 2):

Table 2: HCM – Centroid Linkage

Case	Clusters
Albac, Arieșeni	1
Băișoara, Beliș, Buciumi, Călățele, Căpușu Mare, Ciucea, Gilău, Măguri-Răcățâu, Margău, Marișel, Meseșenii de Jos, Poieni, Rîșca, Românași, Săcuieu, Sâncraiu, Savadisla, Valea Ierii	2
Hălmăgel, Halmăgiu, Moneasa	3

Source: SPSS computation

The program performed a clustering grouping based on the smallest squared Euclidian distance between villages, and then performed a recombination until the three clusters requested were obtained. The main results obtained permitted us to decide that there are another two villages that we have to exclude, respectively Albac and Arieșeni (cluster 1). The dendrogram reflecting the distances between variables can be observed as follows:

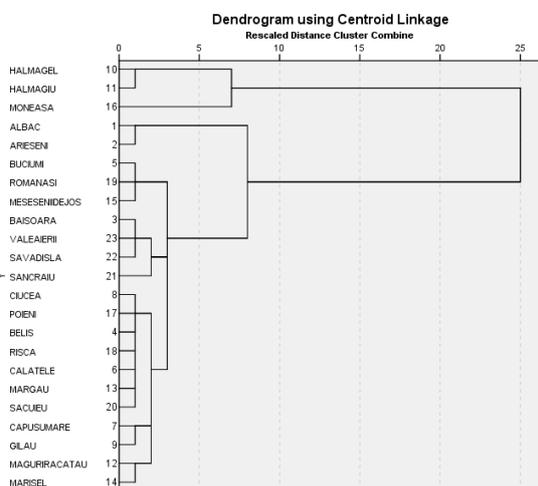


Fig. 2. Dendrogram using Centroid Linkage – Rescaled Distance Cluster Combine

We also exclude the villages grouped in cluster 3 (Hlmăgel, Halmăgiu and Moneasa) because the distances between these localities are too high to create a touristic tour. In this situation we may observe that in Western Carpathian it's possible to create only one touristic region (touristic destination), formed by 18 localities.

But first we have to verify if this villages can be introduced in a tour circuit and to calculate which locality is better dispersed. To obtain this result we applied IDW and ADW methods of calculation (Table 3):

Table 3: Inverted distances weighted (IDW) and the weighted average distances (ADW)

	IDW	ADW
Călățele	0.033	30.6
Poieni	0.031	31.9
Gilău	0.030	32.8
Săcuieu	0.030	33.6
Căpușu Mare	0.029	34.0
Rîșca	0.029	34.2
Beliș	0.029	34.2
Ciucea	0.029	34.3
Margău	0.029	34.4
Savadisla	0.026	37.7
Măguri-Răcățâu	0.024	41.4
Marișel	0.024	41.7
Băișoara	0.023	44.2
Valea Ierii	0.020	50.1
Buciumi	0.019	52.4
Românași	0.019	53.3
Meseșenii de Jos	0.015	68.2
Sâncraiu	0.013	74.3

Source: own calculation

The main results through this methods revealed that there are two more localities that we have to eliminate from our grouping because they are too far from the center of the cluster (Călățele village), respectively Meseșenii de Jos and Sâncraiu (for tour operators an optimum touristic circuit is dispersed on maximum 50-55 km). In conclusion at Western Carpathian level, based on the distances between localities, can be formed a single possible cluster formed by 16 rural villages (Fig.3).



Fig. 3. Cluster mountain villages possible to integrate in a touristic tour-circuit

The touristic dimension of this optimum by proximity cluster, starting from 2012 statistical data, has the following characteristics:

Table 4: Dimension of Western Charpatian possible touristic cluster (2012 data)

Specification	MU	2012
Touristic establishments		
Agroturistic boarding houses	no	60
Share in total rural tourism - Salaj and Cluj counties	%	57.7
Share in total tourism - Salaj and Cluj counties	%	20.6
Touristic accommodation capacity in function		
Agroturistic boarding houses	no places-days	315396
Share in total rural tourism - Salaj and Cluj counties	%	55.7
Share in total tourism - Salaj and Cluj counties	%	8.5
Arrivals of tourists accommodated in the structure of tourists reception		
Agroturistic boarding houses	no	13027
Share in total rural tourism - Salaj and Cluj counties	%	65.0
Share in total tourism - Salaj and Cluj counties	%	3.9
Staying overnight in the establishments of touristic reception		
Agroturistic boarding houses	no	18544
Share in total rural tourism - Salaj and Cluj counties	%	64.2
Share in total tourism - Salaj and Cluj counties	%	3.1
Index of net using the touristic accommodation capacity in function		
Agroturistic boarding houses	%	5.9
Share in total rural tourism - Salaj and Cluj counties	%	86.7
Share in total tourism - Salaj and Cluj counties	%	36.2

Source: own calculation based on NIS data

The cluster concentrates from the total rural touristic offer of Sălaj and Cluj counties 57.7% of touristic accommodation, 55.7% of touristic capacity, 65.0% of tourists and 64.2% of staying overnights. With this dimension the cluster had an occupancy rate of only 5.9%, at 86.7% of rural tourism counties level and 36.2% of total tourism counties level. It's obvious that the touristic activities from cluster's villages need new touristic products to raise the occupancy rate, and one of these solutions is to create tour-circuits (simple tours or hop-on-hop-off tours) which will ease the access in these remote mountain areas.

CONCLUSIONS

At Western Carpathian level our statistical analyze of rural villages with active touristic activities reveal the formation possibility of only one cluster based on distances

proximities. Our main results are that there are 16 villages that can be connected into a cluster which can better promote the local rural tourism activities through complex and integrated touristic products. To develop this kind of products it's necessary to make more detailed studies to know the profile of tourists and to adapt to their needs. But, from an economical point of view, the best networking solution is between the villages that we identify.

REFERENCES

- [1] Cofas, E., 2013, Research on ecotourism resources of the National Park Retezat – Hateg's country-Simpozionul științific internațional „Managementul dezvoltării rurale durabile”, Timișoara, Lucrări științifice, seria I, vol XV (4):107-112
- [2]Cofas, E., 2011, Economic statistics of specific resources and activities of rural tourism, Facultatea de Management Timișoara, Lucrări științifice, seria I, VOL XIII (4): 5-8
- [3]Popa, D., 2012, Touristic destinations mapping method for rural areas in Dolj County, Analele Universității din Oradea, Fascicula: Ecotoxicologie, Zootehnie și Tehnologii de Industrie Alimentară, 11(B), 163-171
- [4] Popa, D., Dona, I., 2012, Estimating the economic potential of rural tourism in the geographical area of Oltenia, Analele Universității din Oradea, Fascicula: Ecotoxicologie, Zootehnie și Tehnologii de Industrie Alimentară, 11(B): 173-181
- [5] Scholl, T., Brenner, T., 2011, Testing for Clustering of Industries Evidence from micro geographic data (No. 2011-02). Philipps University Marburg, Department of Geography.
- [6]Vlad, I.M, Cofas, E., 2012, Evaluation and interpretation in the tourism area, Facultatea de Management Timișoara, Lucrări științifice, seria I, Vol XIV (4): 53-58
- [7]***Carmarthenshire Tourist Association, Carmarthenshire Tourist Association's Rural Tourism Clusters Project, available online at <http://www.tourismclusters.co.uk/index.cfm>
- [8] *** Minister of Regional Development and Tourism - National spatial landscaping plan - Assessment of tourism potential in the administrative territorial units by districts
- [9] ***Rural space analyse study, 2004, National Research and Development Institute for Soil Science Agro-Chemistry and Environment Bucharest
- [10] *** West Carpathian, Welcome to Romania site, http://www.welcometoromania.ro/Romania/Romania_Harta_Carpatii_Occidentali_e.htm

CLIMATE CHANGES AND THEIR EFFECTS ON OLTENIA PLAIN – CARACAL MICROREGION

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Abstract

In our country, the territory with increased risk from droughts, with a tendency to aridity and desertification even includes large areas of southern Oltenia region; we may consider this to be the most exposed to desertification in Romania. In this context, we analyzed the evolution of agriculture in micro area Caracal (in the towns belonging to that micro-area) in the past decade, drawing out the dependence of production on climatic phenomenon. For conditions in Caracal micro area, the Seleaninov indices were calculated and these were correlated with the economic and financial information for the micro region. Our results have revealed that the maize crop is exposed to losses, and the least exposed is the sunflower. Wheat performed relatively better than maize, as demonstrated by the reduction in the period of maize acreage and a slight increase in areas planted with winter wheat. The main conclusion drawn from research undertaken in Caracal micro region is that agriculture is increasingly volatile to climate change variations from one production year to another, with direct implications on the financial results of farmers.

Key words: climate changes, production, Seleaninov indexes

INTRODUCTION

In Romania, the effects of climate change have had and will have a significant impact on the development of natural conditions, agriculture and biodiversity are the most vulnerable areas to climate change, given the dependence on climatic conditions and the negative ecological, economic and social changes affecting the sustainable development of a region.

The weather can have both a direct influence, reflected in agriculture losses, and year indirect impact on the economic growth noticed in case of high dependency on the farming sector [5].

Our country has a growing vulnerability in intensity and frequency of climate extremes (drought, floods, heat, frost, pests and diseases, etc.), producing significant losses in all sectors, especially in agriculture. Thus, it is considered of the approximately 14.7 million ha of agricultural land (of which 9.4 million hectares of arable land) soils affected by long periods of drought and consecutive years are

spread over an area of approx. 7 million ha of agricultural land (48%) and those subject to excess moisture in wet years (about 4 million ha). Drought becomes the limiting factor affecting crops on the largest areas, extent and intensity of this type of risk demising annual fluid reduction of agricultural production of at least 30-50% [8].

Territories with increased risk from droughts, with a tendency to aridity and desertification even include large areas of southern Oltenia considering that this region is most exposed to these phenomena in Romania. Of thermal risks affecting agricultural crops in Oltenia Plain, those with serious effects on production are the maximum temperatures above the critical threshold of 32°C. The amount of days of heat, the deficit widened from the air and ground water, causes major production losses and calamity for spring crops, which in July and August, when the frequency is high risk of these phenomena lies in the critical vegetation phase of flowering. In Oltenia Plain, heat has a high frequency (over 30% of the year), the highest in the whole country

with Teleorman Plain and Danube Valley towards Giurgiu.

Climate change effects on agricultural crops in the southern part of Romania depend on local conditions of each site and the severity of changes in climate [4]. So that the climate characteristics can be used effectively to determine the productive capacity of the land, it must be "true" for the location to which it relates. To meet this goal it is necessary to determine not only the climate as a whole, but also the microclimate (Caracal) each portion of territory in the region (Oltenia) [10].

In this context, we believe that the study area (micro area of Caracal), increased tendency scorching heat and aridity of the climate are phenomena that need to be considered and efforts and financial investments should be intensified in order to create a favorable fitoclimat, a competitive agriculture and a sustainable development [9].

For this, present research consider annual turnover of climatic factors that determine crop yields significant variations from year to year and aims to knowing the impact of climatic variability on yield.

MATERIALS AND METHODS

In the agro meteorological research, impact studies in agriculture are based on weather data / climate and agro meteorological stations with agro meteorological software and climatology archive (archive NIMH), as well as specialized measurements, phenology, and biometric production, made on standard platforms both in the agro-meteorological weather stations and software, as well as production fields located near the weather station.

Fluctuation analysis of agro climatic resources through dynamic evolution of agro meteorological/agro climatic factors constitutes the basic criterion to quantify agricultural drought impact on the vegetation, crop productivity [3]. This method of characterization and evaluation of the influence of climate variability on the species/varieties grown include monitoring of meteorological / climatic factors through the

accumulation of plant evolution (duration and completion of phonological phases) in conjunction with agricultural practice, i.e. cultivation technology applied differently depending on the specific agropedoclimatic conditions.

During the growing season, field crops requirement have differentiated climatic conditions, with highs in the critical phases of crop-specific consumption.

Agrometeorological parameters evolving optimum necessary to carry out properly the physiological processes of plant growth and development are considered risk/stress factors with adverse effects on crop growth status and ultimately on agricultural productions.

Agropedoclimatic risk types defined using agro meteorological and agro climatic indices show that the heat or fluid risk / stress can be classified according to the basic criteria used in the analysis and evaluation of effects on each agricultural species [6] [7]. The decline of the species cultivated productive potential is directly proportional to the intensity, frequency, sequence and duration of action of disturbances – agro meteorological factors.

Winter wheat has a growing season that fall generally between 230 and 250 days, it depends on the variety grown, but especially the growing climatic conditions. Status of vegetation varies throughout the agricultural south, and from one year to another, due to the different agropedoclimatic conditions. In May-June winter wheat goes through the period of maximum sensitivity - "critical period" to environmental conditions - temperature and precipitation, positive or negative deviations from the optimal values are more harmful to plants as they vary in one direction or the other (positive or negative) to the optimum (Table 1).

Table 1. Requirements for air temperature (degrees Celsius) for wheat in the critical period

Month	Air temperature			
	Lethal	Minimum	Optimal	Maximum
May	> 35	8-10	16-20	30-35
June	> 35	8-10	16-22	30-35

Source: Berbecel and colab.

In this critical period, the drought associated with low atmospheric humidity and high maximum temperatures (heat days) causes severe reduction in yields of wheat [1].

Humidity is the second major important factor to winter wheat. Organic range favorable for wheat, from the point of view of precipitation recorded, is between 370 and 875 mm. Latest experimental results from our country considers as optimal for the entire growing season of wheat, the amount of about 600 mm rainfall [10] (Table 2).

Table 2. The optimum of precipitation (l /sq m) in winter wheat / reference thresholds

IX	X	XI-III	IV	V	VI	VII	VIII	IX-VIII
40,0	60,0	200,0	50,0	80,0	80,0	50,0	40,0	600

Source: Teaci

Maize Regarding maize crop requests to temperature, it is assumed that maize is a plant with high requirements to temperature. Temperature requirements of maize in the "critical period" that corresponds to the months of July are illustrated in the following table [1] (Table 3).

Table 3. Requirements for air temperature (degrees Celsius) for maize in the critical period

Month	Air temperature			
	Lethal	Lethal	Lethal	Lethal
July	0	10	Ave. daily temp. < 23	32-33
August	0	16	Ave. daily temp. 21	< 30

As for humidity, the conditions in our country, Bîlteanu [2] established maize production per hectare if the average rainfall totals exceed amounts greater than 40 mm in May, 60 mm in June and July respectively in 80 mm in August. The same author considers optimal distribution of rainfall following: May 60-80 mm, June, 100-120 mm, 100-120 mm in July, August, 60-80 mm. For the three test cultures taken in the thermal limits of survival and that ensures the best results are presented in the following table [10] (Table 4).

Temperature and humidity data above are compared in agro climatic database tests. Many, however, the agro-climatic indicators

are correlated with each other directly, in which case it is not necessary to use only some of them.

Table 4. Thermal limits for wheat, maize and sunflower

Crop	Thermal limits (degrees)			
	Minimum annual average		Absolute min. for survival	Optimal annual average
	For fructification and harvesting the beans	For green mass		
Winter wheat	-6	6	-10 -20 by variety	11
Maize	-7	6	0	12
Sunflower	8	6	-2	10

Source: Teaci

Of these we selected Seleaninov index that measures variations of phenomena in different periods of the year, taking into account the phenomena normally seasonal fluctuations (temperature and precipitation):

$$SHR = \frac{\sum \text{precipitation}}{0.1x \sum \text{average temperature}}$$

Average index was calculated as the average of individual indices shows the same characteristics in different groups variation units. They were determined for the three major crops for micro area analyzed namely wheat, maize and sunflower.

Agro climatic indices of the type Seleaninov were used to calculate regression functions, which describe the dependence of a analytical characteristic result and a characteristic factor. With its synthetic nature and direction they have expressed the relationship between phenomena.

The regression function mirrored the way the scope changed of change characteristic feature resultant factor, apart from the influence of other features considered random, and therefore not included in the analysis.

In our analysis, regression function was a linear feature evenly resultant, changing under the influence of changing factorial feature, the linear function that we used with the formula:

$$y = a + b x,$$

where y values resulting features depend only on x factor values. All other factors are considered constant.

Geometric regression coefficient b is the slope of the straight line. Coefficient was calculated using the method of smallest squares. From the linear regression coefficient b and the correlation coefficient r there was manifested relation:

$$b = \frac{\sigma_y}{\sigma_x} r,$$

where σ_y și σ_x are standard medium deviations of r y, and x characteristics, σ_y și σ_x concrete indicators, expressed by a certain unit of measure.

Their report showed that the linear regression coefficient shows how many units of the variable y per one unit of the variable x. In our case the coefficient has a negative correlation. The correlation coefficient, used to determine the intensity correlation, was calculated using the formula:

$$r = \frac{\sum(x-\bar{x})(y-\bar{y})}{n\sigma_x\sigma_y}$$

where:

x – values of factorial features;

y - values of resulting features;

σ_x – standard medium deviation of the feature x;

σ_y – standard medium deviation of the feature y;

n – number of pairs of values observed attributes of features x and y

or

$$r = \frac{\overline{xy} - \bar{x} - \bar{y}}{\sigma_x \sigma_y}$$

where:

\overline{xy} - average of products xy ($\overline{xy} = \frac{\sum xy}{n}$)

\bar{x} and \bar{y} - average of features x and y.

For the calculation of the correlation coefficient there was used the formula:

$$r = \frac{n\sum xy - (\sum x)(\sum y)}{\sqrt{[n\sum x^2 - (\sum x)^2][n\sum y^2 - (\sum y)^2]}}$$

We then determined curve adjustment operation that was useful, and had to be done; taking into account the data that must be adjusted. For this there was used a continuous, depending on the adjustment of a number of

three parameters: temperature, rain, production.

Regarding interpretation of Seleaninov index, it is measured by SHR value for a given day, or the weather sizes given by Caracal station. Impact (on production) is given by compliance with certain values:

$$I(SHR) = \begin{cases} \min\{M, (1 - SHR) * \theta\} & SHR \in [0, 1.0) \\ 0 & SHR \in [1, 1.4) \\ \min\{M, (1 - SHR) * \theta\} & SHR \in [1.4, 2) \end{cases}$$

where M is the average production, and θ is the analytical adjustment value.

The conditions necessary to obtain the best yields are when the SHR \in (1.0-1.4). When it exceeds 1.4, the output will decrease due to excessive moisture, and when it drops below 1.0, due to the drought. In general, a related SHRI isosline equal to 0,5-0.6 coincides with semi-desert climate conditions.

RESULTS AND DISCUSSIONS

The Caracal Micro area has in its components, beside city of Caracal, another 8 localities (Brastavățu, Bucinișu, Deveselu, Obârșia, Redea, Rotunda, Traian and Vlădila). Agriculture in this micro area is well represented, the following data is very eloquent.

In the year 2012 compared to the Olt county, whose total area was of 549 828 ha, the micro-region was approximately 47 696 i.e. 9%. A similar percentage still holds in terms of agricultural area, the micro area Caracal holding 9.5% of the agricultural area of Olt County. As arable land, the micro area of Caracal had, in the year 2012 at the County level, accounted for over 10% of the total arable area.

In 2012, wheat was cultivated on an area of 19539 hectares, representing 18.1% of the total area cultivated with wheat in the County of Olt and wheat production was of 36905 tones (13.8% of the county's wheat production). Maize was grown in 2012, at the micro area level, on an area of 7015 ha (5.15% of the area cultivated with maize in Olt County) and maize production in the same year totaled 15,550 tons (8.68% of the

County). Sunflower was grown in 2012 on an area of about 9840 ha (19% of the county area planted with sunflower) products obtained being 8135 tones (13.53% of the County).

In the period 2004-2012, the area under wheat increased by 3.8%, the area under maize decreased by 46.8% and the area under sunflower has increased by 80%. During the same period wheat production fluctuated between a minimum of 59 198 tones in 2005 and a peak of 80,000 tons in 2011, the maize from a minimum of 3166 tones in 2007 and a maximum of 9429 tones in 2008, and the sunflower between a minimum of 15 549 tones in 2007 and a peak of 37,000 tons in 2004.

As shown in table 5, fluctuations in production are very high, as a direct consequence of changes in cultivated areas, especially the yields per hectare.

Table 5: The average production of wheat, maize and sunflower in areas of Caracal micro area, during 2004 - 2012 (tons/hectare)

Locality	2004	2005	2006	2007	2008	2009	2010	2011	2012
Wheat									
Brastavățu	3.3	2.5	0.9	2.9	7.1	2.9	2.9	2.6	3.0
Bucinișu	3.3	2.2	2.3	1.0	3.2	2.8	2.8	2.8	0.9
Caracal	2.1	2.7	1.7	0.8	2.6	2.4	2.4	-	2.4
Deveselu	3.3	3.0	0.2	0.8	3.1	3.1	3.1	-	2.6
Obârșia	3.3	5.3	1.0	0.7	2.6	2.6	2.6	2.2	1.9
Redea	3.3	2.8	12.9	1.4	4.2	3.8	3.8	3.5	1.7
Rotunda	3.3	2.8	1.8	0.9	2.8	3.1	3.1	3.1	2.4
Traian	3.3	3.0	1.6	0.5	2.7	2.8	2.8	3.5	1.4
Vlădila	3.3	2.5	1.9	0.9	3.0	2.8	2.8	-	1.3
Total	3.2	3.0	3.5	1.1	3.6	3.1	3.1	1.5	1.6
Maize									
Brastavățu	3.6	4.8	1.0	0.3	1.5	4.0	4.0	4.9	2.4
Bucinișu	3.6	5.0	2.0	0.5	3.0	3.3	3.3	3.1	1.6
Caracal	3.6	3.5	3.5	0.5	4.4	4.3	4.3	-	2.4
Deveselu	3.6	4.0	2.9	0.2	1.2	5.5	5.5	-	3.1
Obârșia	3.6	3.8	3.5	-	1.5	5.5	5.5	2.8	1.4
Redea	3.6	7.8	3.0	0.7	2.2	3.5	3.5	2.7	2.7
Rotunda	3.6	4.5	3.4	0.7	2.7	4.8	4.8	4.2	1.3
Traian	3.6	3.5	2.5	-	2.0	4.0	4.0	8.3	0.5
Vlădila	3.6	2.5	-	0.7	2.0	3.9	6.0	-	2.6
Total	3.6	4.4	2.7	0.5	2.3	4.3	4.1	4.3	2.0
Sunflower									
Brastavățu	1.5	2.5	0.3	0.4	1.7	1.8	1.8	1.6	1.1
Bucinișu	1.5	2.0	1.5	0.4	1.1	1.6	1.6	2.3	1.2
Caracal	1.5	1.3	0.8	0.4	0.7	1.4	1.4	1.84	1.7
Deveselu	1.5	1.4	1.3	0.1	1.2	2.3	2.3	2.5	1.3
Obârșia	1.5	1.3	1.8	0.4	1.2	1.8	0.2	1.6	1.0
Redea	1.5	2.3	1.0	1.0	1.8	1.8	1.8	3.7	0.6
Rotunda	1.5	2.8	1.9	0.5	1.3	0.2	1.8	2.0	0.6
Traian	1.5	1.7	1.56	0.3	1.4	2.2	1.0	2.2	0.6
Vlădila	1.5	1.6	0.2	0.3	1.2	1.2	1.0	1.5	1.4
Total	1.5	1.9	0.9	0.6	1.5	1.6	1.5	2.5	1.0

Source: National Institute of Statistics

In the analyzed period, the strongest influence on productivity was of climatic conditions. To commensurate the climate impact on crops, we applied the index Seleaninov over crops of winter wheat, maize and sunflower, taking into account the growing in features and risks of these three crops in various stages of development (for wheat - April-June, for maize and sunflower - April to August).

Trying to correlate data on the production of wheat, maize and sunflower, with the Seleaninov index (based on temperature and precipitation) there were obtained regression curves like those in the following table (Table 6).

Table 6: Curves adjustment list

State	n	Crop	Seleaninov dependence curve adjustment -	Indices point Loss production
			>Production Graphic	
Caracal		Wheat	$F_{gru}(x) = 3.943x^2 - 1.858x^3$	0.01 90 kg/indices point
		Maize	$F_{porumb}(x) = 3.386x^2 - 0.589x^3$	0.01 175 kg/indices point
		Sunflower	$F_{floarea soarelui}(x) = 4.262x^2 - 2.341x^3$	0.01 45 kg/indices point

Source: own calculations

Following the Seleaninov Index in the last 9 years we find that in four years (2006, 2007, 2008 and 2012) there were droughts, which led to the loss of production from all three crops examined, only five years (2004, 2005, 2009, 2010 and 2011) can be considered normal in terms of temperature and precipitation (Table 7).

Table 7: Seleaninov Index and deviation from normal values – Caracal weather station

2004	2005	2006	2007	2008	2009	2010	2011	2012
Wheat								
Seleaninov Index								
1,11	0,98	0,85	0,8	1,03	1,06	1,01	1,01	0,84
Seleaninov Index deviation from normal values (percentages)								
-	2	15	20	-	-	-	-	14
Maize								
Seleaninov Index								
1,32	1,15	0,83	0,78	0,82	1,1	1,08	1,02	0,81
Seleaninov Index deviation from normal values (percentages)								
-	-	17	22	18	-	-	-	19
Sunflower								
Seleaninov Index								
1,32	1,15	0,83	0,78	0,82	1,1	1,08	1,02	0,81
Seleaninov Index deviation from normal values (percentages)								
-	-	17	22	18	-	-	-	19

Source: own calculations

In these circumstances, we find that farmers in the micro area Caracal lose in terms of significant production in this period, as reflected by the Seleaninov index (Table 8):

Table 8: Production losses reflected by the Seleaninov index to normal values for winter wheat, maize and sunflower (kg / ha)

2004	2005	2006	2007	2008	2009	2010	2011	2012
Winter wheat								
-	-	1530	1980	1620	-	-	-	1710
Maize								
-	-	2975	3850	3150	-	-	-	3325
Sunflower								
-	-	765	990	810	-	-	-	855

Source: own calculations

Losses were over 10 percent in all crops and for all years, the most affected being maize,

which, for example in the last 7 years, the average losses to more than half (58.4% in 2006 over 75% in 2007, almost 62% in 2008 and 65.2% in 2012).

Sunflower crop was also affected by the drought in most years, with 38.9% in 2006, 50.3% in 2007, 41.2% in 2008 and 43.5% in 2012. Noticeable for this crop is the loss in 2007, when production was achieved in less than half the average annual long-range as specialists say, all crops being compromised.

Wheat has proved to be the best enduring crop to unfavorable evolution of climatic elements. The table shows that it has been less affected by the drought; production losses registered in the micro area of Caracal being 34.3% in 2006, 44.5% in 2007 and 36.3% in 2008, following three years are favorable for wheat, as in 2012 losses to be significant again, standing at almost 40% of the value.

We conclude that all these variations from one production year to another actually show vulnerability which exposed farmers in the study area, the climatic factor being decisive. And when we say this, we mean financial losses that farmers had to bear.

Table 9: Financial losses to the farmers reflected by the Seleaninov index to normal values for winter wheat, maize and sunflower (lei / ha)

2006	2007	2008	2012
Winter wheat (kg/ha)			
1530	1980	1620	1710
Winter wheat (lei/ha)			
474,3	1267,2	1134	1522,5
Maize (kg/ha)			
2975	3850	3150	3325
Maize (lei/ha)			
1011,5	2502,5	2236,5	2360,7
Sunflower (kg/ha)			
765	990	810	855
Sunflower (lei/ha)			
428,4	811,8	1012,5	1492,2

Source: own calculations

The following table presents what level stood for a hectare of crop losses in the micro area of Caracal, taking into account the losses of production and the prices of those years. As seen in the years that have losses in

production (2006, 2007, 2008, 2012) there were recorded financial losses that varied quite much.

Thus, for the wheat crop, the biggest losses were obtained in 2012 (1522.5 Lei). This was due on the one hand, to large physical loss of that production year and, on the other hand, high wheat prices were recorded that year. Losses were recorded in 2007, severe drought year, when harvests were compromised micro area almost in total.

For maize, losses were even higher, reaching for example in 2007 to 2502.5 Lei to 2236.5 Lei in 2008 and 2360.7 Lei in 2012. Of the three crops analyzed losses were the lowest for sunflower crops (compared to the other two crops), varying between a minimum of 428.4 Lei in 2004, to a maximum of 1492.2 Lei in 2012.

CONCLUSIONS

Impact of climate variability on growth and development of agricultural crops is quantified by the potentiality of weather parameters to ensure optimum growing conditions or adverse effects.

For Romania, in general, and Oltenia and Caracal micro region, in special, climate change has had and will have a significant impact on the development of natural conditions. Here, agriculture and biodiversity are the area's most vulnerable to the effects of these changes given to the dependence of climatic conditions and to the negative effects of ecological, economic and social conditions. Actually, a big part of Oltenia area presents an increased risk to droughts and have a tendency to aridity and desertification.

Our research was concentrating to the evaluation of implication of risk involved in agriculture. Calculation of Seleaninov indexes and their correlation with the economic and financial results at Caracal micro region level come to confirm that the agriculture is increasingly volatile to climate change variations. In addition, the yield variations and the financial results have direct implications on income levels and living standard.

Based on the results obtained, we conclude that the maize crop is exposed to losses and the least exposed is the sunflower. Wheat performed relatively better than corn, as demonstrated by the reduction in the period of corn acreage and a slight increase in areas planted with winter wheat. Therefore, we conclude that variations from one production year to another actually show vulnerability of exposed farmers in the study area, the climatic factor being decisive. And when we say this we mean financial losses that farmers had to bear.

In these conditions, to counter the effects of agro-climatic risks involved in production for the Caracal micro region we propose:

- Measures to improve the efficiency of water resources, especially for maize;
- Adaptation measures to climate change:
 - o Farming practices to reduce effects such as: a selection of agricultural measures allowing water preserving; assessment and quantification measures; develop immediate and adaptation strategies in the future;
 - o An efficient crop management and land use: selection of varieties/genotypes; crop rotation; tillage system;
 - o Risk management and climate change impacts on agricultural productivity through the adoption of strategies including: a diagnosis and prognosis of their occurrence; monitoring of such phenomena; environmental protection measures by specific plant technology systems and ways of use adapted to local conditions; the support of agricultural technology and alternative agricultural management practices in order to prevent and mitigate the possible negative effects on the vegetation and agricultural yields in areas most vulnerable to climate risks.
- Measures on the development of an efficient agricultural insurance.

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REFERENCES

- [1] Berbecel O. Et al., 1970, Agrometeorologia (Agrometeorology), Editura Ceres, București.
- [2] Bîlteanu, G., 1998, Fitotehnie (Phytotechnics), 1, Ediția a doua, Editura Ceres, București.
- [3] Cofas Elena, Toma Elena, Dumitru S., 2012, Research on the influence of climatic factors on agricultural production plant in Ialomita county, Conferința Științifică Internațională "Eco-Trend", Tg. Jiu, House Publisher Academica Brâncuși, pg. 302-310
- [4] Cuculeanu, V., Marica, A., Simota, C., 1999, Climate change impacts on agricultural crops in Romania and adaptation options, Climate Research (CR SPECIAL 6, Book Version), Inter-Research Germany, 12:153-160
- [5] Hurduzeu, G., Constantin, L., 2008, Several Aspects Regarding Weather and Weather Derivatives, Jurnalul Economic - The Romanian Economic Journal, 27: 187-203
- [6] Hurduzeu, G., Mateescu, E., Kevorchian, C. et al., 2009, Raport de cercetare Cercetări și extensie privind managementul riscurilor agropedoclimatice prin derivate pe factori climatici (Research and Extension Research Report on agropedoclimatic risk management by derivatives in climatic factors), ASE București
- [7] Kevorchian, C., Hurduzeu, G., Gavrilesu, C., 2012, Utilizarea instrumentelor derivate cu opțiuni pentru managementul riscurilor meteo în fermele agricole din Sud-Estul României, în Economia agroalimentară și dezvoltarea rurală în România. Implicații ale PAC asupra securității alimentare (The use of derivatives for risk management options forecasts on farms in Southeastern Romania, agro-economy and rural development in Romania. Implications of CAP on food security), Editura Academiei Române, București.
- [8] Sandu, I., Mateescu, E., Vătămanu V.V., 2010, Schimbările climatice în România și efectele asupra agriculturii (Romania and the effects of climate change on agriculture), Editura SITECH, Craiova
- [9] Simota C., Marica A., Cuculeanu V., 2003, Impactul schimbării climei asupra ecosistemelor agricole; evaluarea vulnerabilitatii si a masurilor de adaptare (Impact of climate change on agricultural ecosystems, vulnerability assessment and adaptation measures), Ed. ARS DOCENDI, Academia Romana-Comitetul National pentru Modificarile Globale ale Mediului, pg 37-99
- [10] Teaci D., 1980, Bonitatea terenurilor agricole (farming land evaluation), Editura Ceres, București, p. 23

WHAT ARE THE BARRIERS TO THE DEVELOPMENT OF ORGANIC FARMING?

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Abstract

The main purpose of this study was to investigate the main barriers to development of organic farming system in Kermanshah Province, Iran. Statistical population in this study consisted of all farmers in Kermanshah province, Iran. Applying stratified random sampling method, 137 farmers were selected as a sample. The main instrument in this study was questionnaire which its validity was confirmed by the panel of experts and its reliability was established by Cronbach's Alpha coefficient. Data was analyzed by SPSSWin16 software. Principal component analysis was used as main statistical technique to analyze the data. The results of factor analysis revealed that 4 factors including "Infrastructural", "technical-managerial", "economic-financial" and "educational" explained 42.36 percent of the variance. Results of this study have applications for agriculture development policy-makers for development of organic farming in Iran.

Key words: Iran, organic farming, sustainable agriculture, sustainable development

INTRODUCTION

Rapid development of science and new technologies such as genetic engineering and biotechnology, high yielding crop varieties and indiscriminate use of chemical fertilizers and pesticides have substantially increased agricultural productions and many developed and developing countries overcome the problem of food production, but this increase in production has always been incurred by many environmental problems such as pollution of soil and water resources, occurrence of new pests and plant diseases and malnutrition and disease due to reducing quality of the food production [1]. Today, all these factors lead to consider environmental conservation and food health and security as important challenges and international communities seek appropriate strategies to solve these problems and achieve sustainable agricultural systems [2]. As an innovative approach versus conventional farming system, organic farming system is an important strategy [3], and increasingly being accepted

in many countries and different international organizations throughout the world. In other words, due to environmental and human health considerations, different countries are even more interested to organic farming and consumption of organic products [4]. In this regard, many experts believe that organic farming is a new paradigm [5, 6, 7, 8 & 9] to deal with the destructive effects of conventional farming system.

Organic farming is one of sustainable farming systems based on minimal use of external and expensive inputs of chemical fertilizers and pesticides [10]. In other words, organic farming is a modern and scientific approach to conventional agriculture [11]. Many practices applied in organic farming, such as minimum tillage, use of nitrogen-fixing plants, take agricultural residues back into the soil and use of cover crops that increase the carbon back into the soil and its storage and conservation [12]. Despite the benefits of organic farming systems, extant evidence suggests that during the years 1950 to 1996 fertilizers consumption worldwide has been increased to more than

two times [13]. In Iran country, about 4.1 million tons chemical fertilizers and pesticides have been distributed among farmers in the years 2004-2005 [14].

In this regard, different studies show that the development of organic farming have been faced by many problems, such as lack of knowledge and skill to manage an organic farm, lack of market opportunities for organic products and lack of positive attitude toward organic farming [15], low income of farmers, lack of extension education and lack of market opportunities and required inputs [16], lack of confidence in the production process of organic yields, lack of market information, production problems and lack of information about organic production [17], lack of information and experience on organic productions and their markets [18], and little knowledge of farmers, their limited motivation to learn more about organic farming [19, 20]. Hence, with the importance of organic farming and global developments in this area, the development of organic farming systems is necessary. For the same purpose, Kermanshah Province, with having good privileges of the agricultural development, can play a significant role in the economic development of Iran as an important hub for future agriculture. An essential strategy for development of sustainable agriculture in Iran can be formulated sound platforms for agricultural development in this Province [21]. As a result; the development of organic agriculture among farmers in Kermanshah Province should be placed as top priority in the programs of agricultural development. But as mentioned earlier, despite many benefits of organic farming systems, extant evidence suggests the lack of development of organic farming among farmers in developing countries, like Iran. Accordingly, the present study aimed to assess barriers to the development of organic farming system from the perspective of farmers in Kermanshah Province, Iran.

MATERIALS AND METHODS

The present study was carried out in Kermanshah province, Iran to identify main

Barriers to development of organic farming from the viewpoints of Farmers. Using Cochran's sampling formula, 137 farmers were selected as a sample. Respondents were selected by using Stratified random sampling method. The data were collected through a structured questionnaire. Validity of the questionnaire was assessed through panel of expert in department of agricultural extension and education faculty members. Reliability of the main scales of the questionnaire was also computed by Cronbach's Alpha method. The coefficient of Cranbach's was equal to 0.86 which was appropriate for the study. Factor analysis was applied as main statistical technique to analyze the data.

RESULTS AND DISCUSSIONS

In this study exploratory factor analysis (EFA) with data reduction approach was employed. The main objective of this technique is to classify a large number of variables into a small number of factors based on relationships among variables. For this purpose 18 variables were selected for the analysis. To determine the appropriateness of data and measure the homogeneity of variables on organic farming system barriers from the viewpoints of farmers, the Kaiser-Meyer-Olkin (KMO) and Bartlett's test measures were applied. These statistics show the extent to which the indicators of a construct belong to each other.

Table 1. KOM measure and Bartlett's test to assess appropriateness of data for factor analysis

	Bartlett's test	
KMO	Approx. chi-square	Sig.
0.856	3945.8184	0.000

KMO and Bartlett's test obtained for these variables show that the data are appropriate for factor analysis as indicated in Table (1).

In present study, the total variables were significantly loaded into four factors. These factors explained 42.36 percent of total variance of components of organic farming system barriers. However, the Kaiser criterion was utilized to arrive at a specific number of factors to extract. Based on this criterion, only

factors with eigenvalues greater than one were retained. Accordingly, four factors with eigenvalues over one were extracted. The eigenvalues and percentage of variance explained by each factor are shown in Table (2).

Table 2: Number of extracted factors, eigenvalue and variances explained by each factor

Factors	Eigenvalue	% of variance	Cumulative % of variance
1	4.08	11.67	11.67
2	3.89	11.14	22.81
3	3.46	9.88	32.69
4	3.38	9.67	42.36

Eigenvalues drive the variances explained by each factor. Sum of squares of factor's loadings (eigenvalue) indicates the relative importance of each factor in accounting for the variance associated with the set of variables being analyzed. According to Table (2) eigenvalues for factor 1 through 4 are 4.08, 3.89, 3.46 and 3.38, respectively.

The percentage of trace (variance explained by each of the four factors) is also shown in Table (2). The traces for factor 1 through 4 are 11.67, 11.14, 9.88 and 9.67, respectively. The total percentage of the trace indicates how well a particular factor solution accounts for what all the variables together represent. This index for the present solution shows that 42.36 percent of the total variance is represented by the variables contained in the factor matrix. The VARIMAX rotated factor analysis is shown in table 3. In determining factors lodgings greater than 0.50 were considered as to be significant. As anticipated, the first factor accounts for 11.67 percent of variance and 4 variables were loaded significantly. These variables were presented in table 3. A relevant name for this on loading's pattern is "Infrastructural barriers". Eigen value of this factor is 4.08, which is placed at the first priority among the barriers of organic farming system in Kermanshah province, Iran. The second factor is associated mostly with the variables related to technical-managerial barriers. Thus this factor can be named as "technical-managerial barriers". The Eigen value for this factor is 3.89 which

explain 11.14 percent of the total variance (table 3).

Table 3: Variables loaded in the factors using VARIMAX rotated factor analysis

Name of factor	Variables loaded in the factor	Factor loadings
Infrastructural barriers	Lack of adequate market for the sale	0.816
	Lack of storage Location	0.841
	Lack of equipment needed to transport	0.839
	Lack of government support	0.794
technical-managerial barriers	Low awareness level about managerial skills	0.657
	Weed control problems	0.511
	Disease and pest control problems	0.726
	Skilled Manpower Shortage	0.661
economic-financial barriers	Reduce production	0.633
	Lack of financial capital	0.705
	Loss of income	0.671
	Low prices for organic products	0.694
educational barriers	Far distance of plots from education services	0.719
	Low coverage of extension education programs	0.536
	Low awareness level about organic farming	0.712
	Lack of extensional magazines	0.634
	Low access to agricultural extension experts	0.517
	Illiterate farmers	0.575

The name assigned to the third factor is "economic- financial barriers". This factor with eigenvalue of 3.46 explains 9.88 percent of total variance of Barriers to development of organic farming (table 3). The fourth factor contains 6 variables relating to "educational barriers". This factor with eigenvalue of 3.38 explains 9.68 percent of total variance (table 3).

CONCLUSIONS

Due to environmental problems of conventional agriculture in many countries, most agricultural policy makers are considered organic farming system as a new approach of environmental protection to achieve food security and sustainable agricultural development. In this regard, extant evidence suggests that in many countries, especially in developing countries, the adoption of organic farming has been limited. Accordingly, in the first stage, it is essential to identify barriers to the development of organic farming systems from the perspective of farmers. Therefore, the

present study was conducted to examine barriers concerning the development of organic farming system in Kermanshah Province, yielded following results:

Findings showed that the main obstacle to the development of organic farming is infrastructure issues. Therefore, it is necessary that agricultural policy makers consider infrastructure problems such as establishment of appropriate market for the sale of organic products, convenient place to store these products and support organic producers to grow organic crops to make possible the development of organic farming in Kermanshah Province. Technical and management barriers are another obstacle faced by farmers to grow organic products. This means that farmers have not the necessary technical and managerial skills in the field of organic farming system. Thus, it is essential that farmers should be equipped with the technical and managerial skills in order to developing organic farming systems in Kermanshah Province. The third obstacle faced by the farmers in the field of producing organic crops is economic- financial barriers. This means that farmers can't afford the financial and economic issues related to produce these organic crops. As a result, supporting farmers in the fields of finance and economics can facilitate the development of organic farming systems in Kermanshah Province. The last obstacle to the development of organic farming is training issues. In this case, farmers have not the suitable knowledge about organic farming systems. Moreover, as related to training issues, there are not necessary experts knowledgeable to the field of organic farming. Hence, to tackle these training issues of the development of organic farming in Kermanshah Province, agricultural development's policy makers should take measures to set up training- extension sessions.

REFERENCES

[1]Kiyani, G.H., Liyaghati, H., 2007, Analysis of economic conditions current agricultural conversion to

organic farming by using dynamic linear programming model. 2th National Congress of Ecological agriculture, Gorgan, Iran.

[2]Mafi, H., 2008, Organic Farming. Available at: www.crop.blogeky.com

[3]King, D., Ilbery, B., 2012, Farmers' attitudes towards organic and conventional agriculture: a behavioural perspective. *Organic Food and Agriculture - New Trends and Developments in the Social Sciences*, Dr Matthew Reed (Ed.), ISBN: 978-953-307-764-2, In Tech, Available from: <http://www.intechopen.com/books/organic-food-and-agriculture-new-trends-and-developments-in-the-socialsciences/farmers-attitudes-towards-organic-and-conventional-agriculture-a-behavioural-perspective>.

[4]Grossman, M., 1972, On the concept of health capital and the demand for health. *Journal of Political Economy*, 80 (2): 223-255.

[5]Dimara, E., Petrou A., Skuras, D., 2003, The socio-economics of niche market creation: A social ecology paradigm for the adoption of organic cultivation in Greece. *International Journal of Social Economics*, 30 (3): 219-235.

[6]Abaidoo, S., Dickinson, H., 2002, Alternative and conventional agricultural paradigms: Evidence from farming in southwest Saskatchewan. *Rural Sociology*, 67 (1): 114-131.

[7]Wynen, E., 1996, Research implications of a paradigm shift in agriculture: the case of organic farming. *Resource and Environmental Studies*, No. 12, Centre for Resource and Environmental Studies, ANU.

[8]Beus, C., Dunlap, R.E., 1990, Conventional versus alternative agriculture: the paradigmatic roots of the debate. *Rural Sociology*, 55 (4): 590-616.

[9]Dahlberg, K.A., 1986, *New Directions for Agriculture and Agricultural Research: Neglected Dimensions and Emerging Alternatives*. Rowman & Allanheld Publishers, New Jersey.

[10]Ramesh, P., Singh, M., Subba Rao, A., 2005, Organic farming: Its relevance to the Indian context. *Current Science*, 88: 561-568.

[11]Abdollahi, S., 2008, Study of Perspective of development of organic forming. *Planning and Agricultural Economics Research Institute*, No. 51, pp. 24-35.

[12]Chaghmaghi Yazdi, M., Moradi, A., 2007, Organic Farming, way of Human salvation. Available at: <http://plantdiseases.blogfa.com/cat-91.aspx>

[13]Akbari, M., Asadi, A., 2005, Some of the modern agriculture in soil and environments. *Proceedings of soil, Karaj*.

[14]Babaakbari, M., Movahedian, M., 2006, Improvement fertilizer consumption with regard to country budget laws. *Proceedings of the 10th soil science in Iran, Karaj*.

[15] Khaledi, M., Gray, R. Weseen, S., Sawyer, E., 2007, Assessing the barriers to conversion to organic farming: an institutional analysis. Submitted to: *Advancing Canadian Agriculture and Agri-Food Saskatchewan (ACAAFS)*.

- [16]Salazar, R. C., 2005, Social and institutional opportunities and constraints of organic agriculture in the Philipines. Stuttgat-Hohenheim, October 11-13.
- [17] Sterrett, S, Groover, G. E, Taylor, D. B, Mundy, K., 2005, Describing Organic Agriculture Production in Virginia Results of the 2004 Farm Survey Virginia's Rural Economic Analysis Program, Department of Agricultural and Applied Economics, College of Agriculture and Life Sciences, Virginia Tech.
- [18]Waltz, E., 1999, Final results of the Third National Organic Farmer^s Survey. Organic Farming Research Foundation. 126pp.
- [19]Fairweather, J. R., 1999, Understanding how farmers choose between organic and conventional production: results from New Zealand and policy implications. Agriculture and Human Values 1651- 63.
- [20]De Buck, A. J, Rijn, I. V, Roling, N. G, Wossink, A. A., 2001, Farmers reasons for changing or not changing to more sustainable practices: an exploratory study of arable farmers in the Netherlands. The Journal for agricultural Extension and Education 7 (3), 153-166.
- [21] Pourjavid, S. Alibaygi, A., Zarafshani, K., 2011, Predictors of teaching efficacy secondary vocational agricultural schools teachers in Kermanshah province. Agricultural education admistraion research, No. 17, 67- 80.

FEASIBILITY OF INVESTMENTS IN CULTIVATION OF TOMATOES IN PROTECTED AREAS

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Abstract

The main purpose of this paper is to identify the amount of investments required for the establishment of greenhouses, which would ensure quality, productivity and competitiveness of the products concerned. The feasibility of investments for the establishment of permanent greenhouses is based on the following method: development of a budget for investments for the establishment of permanent greenhouses and a budget for cultivation of tomatoes with analysis of the economic performance. Based on the above mentioned, it can be stated that permanent greenhouses are fit for growing a wide range of vegetables in one or two cycles, for obtaining homogeneous crops by size and quality with high productivity per hectare, which contributes to higher cost efficiency and state subsidies for entrepreneurs.

Key words: consumption, cost, feasibility, investments, price, profit

INTRODUCTION

The integration objective of the Republic of Moldova in the international economic system as a competitive partner imposes a qualitative change of the actual situation within the agro-food sector. The globalization of the world economy and the technical – scientific progress provides new possibilities for increasing the efficiency of more levels of the agriculture. For Moldova, the achievement of this task can be reached through prior orientation towards the production and export of high value agro-food products, for which there are profitable and modern markets.

In a market economy, agricultural entrepreneurs should closely consider initiating and launching a business to have a proper understanding of the business implementation and amount of investments. The budget for investments for the establishment of greenhouses and cultivation of vegetables should be analyzed from the following viewpoints:

-The most important issue is whether selected technology allows to ensure **quality, productivity and competitive price** in

vegetable production. Only high quality and productivity of vegetables will allow us to compete and penetrate strategic markets of vegetables.

-An important issue is the optimal use of production factors at the agricultural holding.
-The value of required investments and their payback in the shortest possible period.

These are the most important aspects to be taken into account when establishing a greenhouse and, in order to take a correct decision, the farmer should avail of technological and economic information.

MATERIALS AND METHODS

Materials used for analyzes and research were the Statistical Yearbooks of the Republic of Moldova, the data provided by the Ministry of Agriculture and Food Industry on the development of the agricultural sector, in particular the high value agriculture, data collected from agricultural enterprises producing tomatoes in protected areas. To analyse the feasibility of investments for the establishment of greenhouses, the proposed material is based on the following method: development of a

budget for investments for the establishment of greenhouses, for cultivation of tomatoes in one cycle, a budget for a greenhouse, analysis of results and drafting final conclusions on the analysed issue – feasibility of investments. The calculations showed that the cultivation of tomatoes in permanent greenhouses is the best option for agricultural entrepreneurs, which offers real opportunities to compete in terms of price and quality with vegetables produced both on the domestic and the regional market.

RESULTS AND DISCUSSIONS

Tomatoes are grown for their fruit used as fresh, cooked, dried, canned food and juices. Tomatoes play an important role in food industry. Cultivation of tomatoes in protected areas is a perspective branch of vegetable production. Currently, there is a positive trend in the development of vegetable production in protected areas through a constant increase in greenhouse areas, farmers' high interest in conducting such a business, a short payback period and government support through subsidies to compensate a part of investments for initiation or development of vegetable cultivation in greenhouses.

Photo 1. Protected Areas



Cultivation of tomatoes (especially in protected areas) plays an important role in the economy and food industry. Production of tomatoes has the following advantages:

- ✓ tomatoes are used extensively in human nutrition and in the processing industry;

- ✓ tomatoes are rich in nutrients;
- ✓ tomato is a crop that ensures high profits and efficient use of production factors;
- ✓ tomatoes can grow from seeds and seedlings both in greenhouses and in the open field;
- ✓ they are in high demand on the domestic and foreign tomato markets, especially as fresh products all the year round.

Investments in establishing permanent greenhouses. For a successful production of tomatoes in protected areas, the producer should have arable land, capacity for irrigation, access to electricity, adjacent buildings. Cultivation of tomatoes in greenhouses requires considerable investment in fixed assets.

This business of cultivation of tomatoes in greenhouses entails the implementation of an investment pattern through construction of permanent greenhouses that are relatively expensive. Permanent buildings have a high production potential, which allows for a number of production cycles, a better modelling of production factors.



Photo 2. Protected Areas

Cultivation of tomatoes in permanent greenhouses allows farmers to sell tomatoes on agricultural markets out of the season (at reasonable prices), obtain a good quality and a high yield potential compared to other types of greenhouses (solariums, tunnels) and, certainly, cultivation of tomatoes in the open field.

The investment pattern entails the estimates of investments for the construction of two greenhouse modules (size: 9X60 m or 540 sq. m) with a total area of 1080 sq. m,

available on the domestic market and ensuring a considerable sustainability for the farmer and efficient business practice.

Table 1: Budget for investments for establishing permanent greenhouses, area of 1080 sq. m

Specification	UM	Quantity	Unit price, MDL	Total investments, MDL
2 greenhouse modules (greenhouse area, S=540 sq. m)	sq. m	1,080	250	270,000
200 micron film	sq. m	2,700	25	67,500
Water tank - 10 m ³	m ³	10	750	7,500
Drip irrigation system	ha	0.1	15,000	1,500
Water pump	unit	1	2,500	2,500
Direct combustion generators	unit	2	7,500	15,000
Plastic crates for harvesting tomatoes	unit	100	12	1,200
Greenhouse inventory	X	X	5,000	5,000
Contingencies (5% of total)	X	X	X	18,510
Total investments	X	X	X	388,710

Source: Calculations made by authors

Investments for permanent greenhouses of 10 acres were estimated at **388,710 MDL**.

proposed option for cultivation of tomatoes, the potential average yield was estimated at **26 t/1080 m²**.

Photo 3. Tomatoes



For the cultivation of tomatoes, both in the protected area and in the open field, the farmer should provide circulating means of optimal quality and quantity for the technologic process. In Moldova, tomatoes can be grown by sowing seeds or by planting seedlings.

Tomato seedlings can be produced in home conditions (greenhouses) or can be purchased from companies specialized in producing seedlings.

The table below shows an economic model of cultivation of tomatoes in protected areas (area of 1080 square meters), with estimates of the economic performance and clear arguments for conducting such a business, aimed at the development of high value agriculture. For the



Photo 5. Tomatoes

Based on calculations shown in the table above for a permanent greenhouse with an area of 10 acres, the amount of income from sale of tomatoes is 174,960 MDL and the cost of sales is 91,745.2 MDL. Given this, the annual profit that may be obtained amounts to 83,214.8 MDL from 10 acres of permanent greenhouses for tomatoes with indeterminate growth.

Table 2: Budget for cultivation of tomatoes in greenhouses (greenhouse area = 10 acres)

Specification	UM	Unit price, MDL	Intensive technology - 1080 sq. m		
			Quantity	Amount, MDL	Consumption structure, %
I. Income from sales	MDL	X	25,920	174,960	X
Tomatoes sold – cold season (50%)	kg	9.0	12,960	116,640	X
Tomatoes sold - mass harvesting season (50%)	kg	4.5	12,960	58,320	X
II. Cost of production means	MDL	X	X	23,860.7	26.01%
Seed material (seedlings)	MDL/unit	2.50	3,240	8,100.0	8.83%
Mineral fertilizers:	MDL	X	X	535.4	0.58%
- Nitrogen (<i>Ammonia soda</i>)	kg	4.50	20	90.0	0.10%
- Phosphate (<i>Superphosphate</i>)	kg	7.00	40	280.0	0.31%
- Macro and micronutrients (<i>Cristalon</i>)	kg	27.70	2	55.4	0.06%
- Macro and micronutrients (<i>Terraflax T</i>)	kg	22.00	5	110.0	0.12%
Chemicals:	MDL	X	X	375.3	0.41%
- Herbicide (<i>Triflurex 480 EC</i>)	l	109.20	0.25	27.3	0.03%
- Herbicide (<i>Agil 100 EC</i>)	l	374.40	0.13	46.8	0.05%
- Insecticide (<i>Actara 25 WG</i>)	kg	1,659.84	0.01	16.6	0.02%
- Fungicide (<i>Cuproxat SC</i>)	kg	77.38	0.50	38.7	0.04%
- Insecticide (<i>Confidor 200 SL</i>)	kg	673.92	0.05	33.7	0.04%
- Fungicide (<i>Tatoo 55 SC</i>)	l	157.25	0.30	47.2	0.05%
- Fungicide (<i>Ridomil Gold 68 WG</i>)	kg	197.18	0.25	49.3	0.05%
- Fungicide (<i>Kocide 2000</i>)	kg	148.51	0.30	44.6	0.05%
- Fungicide (<i>Acrobat 79 WP</i>)	l	188.50	0.20	37.7	0.04%
- Insecticide (<i>Calypso 480 SC</i>)	l	1,340.35	0.03	33.5	0.04%
Expenses for electricity	MDL/month	350.00	10.00	3,500.0	3.81%
Greenhouse heating	MDL/l	7.00	1,500	10,500.0	11.44%
Water (irrigation)	m ³	8.50	100	850.0	0.93%
III. Cost of machinery services	MDL	X	X	1,944.0	2.12%
Transportation of sold crops (L=15 km)	t/km	5.00	389	1,944.0	2.12%
IV. Manual operations	MDL	X	X	24,000.0	26.16%
2 permanent workers (working 8 months)	om/luna	1,500.00	16	24,000.0	26.16%
V. Expenses - wear of production means	MDL	X	X	33,600.0	36.62%
VI. Contingencies (10%) (II+III+IV+V)*0.1	MDL	X	X	8,340.5	9.09%
VII. Consumption - total (II+III+IV+V+VI)	MDL	X	X	91,745.2	100.00%
VIII. Profit (I-VII)	MDL	X	X	83,214.8	X

Source: Calculations made by authors

Table 3: Payback period

Indicators	UM	Amount
Total investments	MDL	388,710.0
Net profit	MDL	83,214.8
Payback period	years	4.67

Source: Calculations made by authors

Based on the total amount of investments in building a permanent greenhouse with an area of 10 acres and the planned annual profit, their payback period will be 4.67 years for the entrepreneur, which generates a practical interest in rural areas to diversify activities and income.

CONCLUSIONS

Why namely the technology of cultivation of tomatoes in greenhouses? The answer to this question can be found in the following:

- Greenhouses allow to obtain qualitative tomatoes (homogeneous by size and quality) all the year round;
- High yield of tomatoes in greenhouses allows to establish unit costs for competitive products, which is extremely important in a severe competition on regional markets;
- Production factors available in greenhouses are used extensively;
- Establishment of greenhouses is supported by substantial subsidies;
- Purchase prices for tomatoes grown in greenhouses will remain competitive, and greenhouses ensure a high profitability under these circumstances;
- The influence of natural factors that may affect the crops and their harvesting is excluded.

REFERENCES

- [1]Stratan A., Zbancă A., Morei V., Litvin A., 2009, Ghid privind argumentarea economică a activităților din agricultura Republicii Moldova (sector vegetal), Editura Bons Offices, Chișinău p.2016
- [2]Rosca V., 2009, Tehnologii moderne de producere a răsadurilor de legume, Editura Print-Caro, Chișinău, p. 176